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PARTS 41 TO 69
Revised as of October 1, 1981

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PARTS 41 TO 69

Revised as of October 1, 1981

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Explanation

The Code of Federal Regulations is a codification of the general and permanent rules published in the Federal Register by the Executive departments and agencies of the Federal Government. The Code is divided into 50 titles which represent broad areas subject to Federal regulation. Each title is divided into chapters which usually bear the name of the issuing agency. Each chapter is further subdivided into parts covering specific regulatory areas.

ISSUE DATES

Each volume of the Code is revised at least once each calendar year and issued on a quarterly basis approximately as follows:

Title 1 through Title 16	as of January 1
Title 17 through Title 27	as of April 1
Title 28 through Title 41	as of July 1
Title 42 through Title 50	as of October 1

The appropriate revision date is printed on the cover of each volume.

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The contents of the Federal Register are required to be judicially noticed (44 U.S.C. 1507). The Code of Federal Regulations is prima facie evidence of the text of the original documents (44 U.S.C. 1510).

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JOHN E. BYRNE,
Director,
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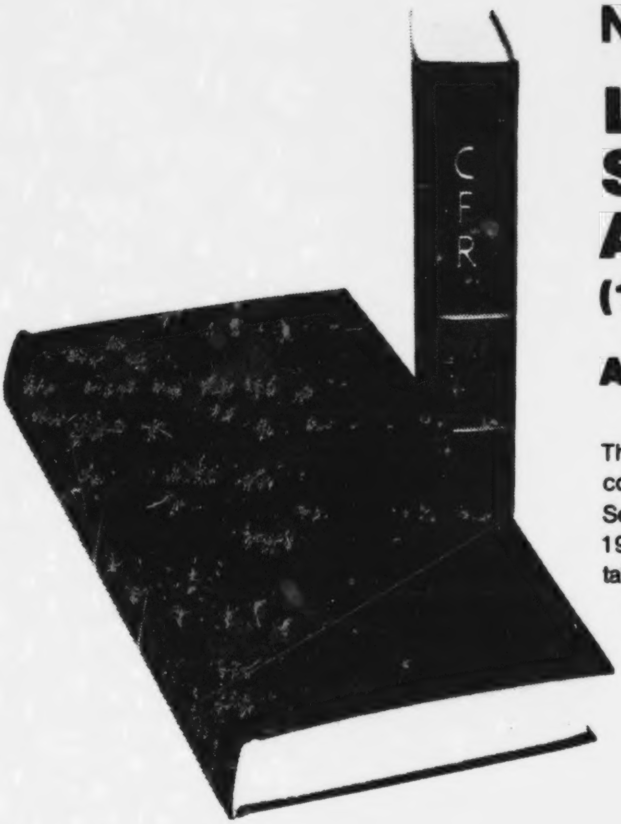
October 1, 1981.



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Title 46—SHIPPING is composed of ten volumes. The parts in these volumes are arranged in the following order: Parts 1-29, 30-40, 41-69, 70-89, 90-109, 110-139, 140-155, 156-165, 166-199 and 200-end. The first nine volumes containing Parts 1-199 comprise Chapter I—Coast Guard, Department of Transportation. The tenth volume containing Parts 200 to end includes Chapter II—Maritime Administration, Department of Transportation, Chapter III—Coast Guard (Great Lakes Pilotage), Department of Transportation and Chapter IV—Federal Maritime Commission. The contents of these volumes represent all current regulations codified under this title of the CFR as of October 1, 1981.

Subject indexes appear for Subchapter B—Merchant Marine Officers and Seamen and Subchapter C—Uninspected Vessels following the subchapters in Parts 1-29; for Subchapter D—Tank Vessels in the Finding Aids section of Parts 30-40; for Subchapter F—Marine Engineering following the subchapter in Parts 41-69; for Subchapter H—Passenger Vessels following the subchapter in Parts 70-89; for Subchapter I—Cargo and Miscellaneous Vessels following the subchapter in Parts 90-109; for Subchapter J—Electrical Engineering following the subchapter in Parts 110-139; for Subchapter P—Manning of Vessels following the subchapter in Parts 155-165; and for Subchapter T—Small Passenger Vessels (Under 100 Gross Tons) following the subchapter in Parts 166-199.

For this volume Donna L. Rickett was Chief Editor, assisted by D. W. Leland. The Code of Federal Regulations publication program is under the editorial direction of Martha B. Girard, assisted by Robert E. Jordan.

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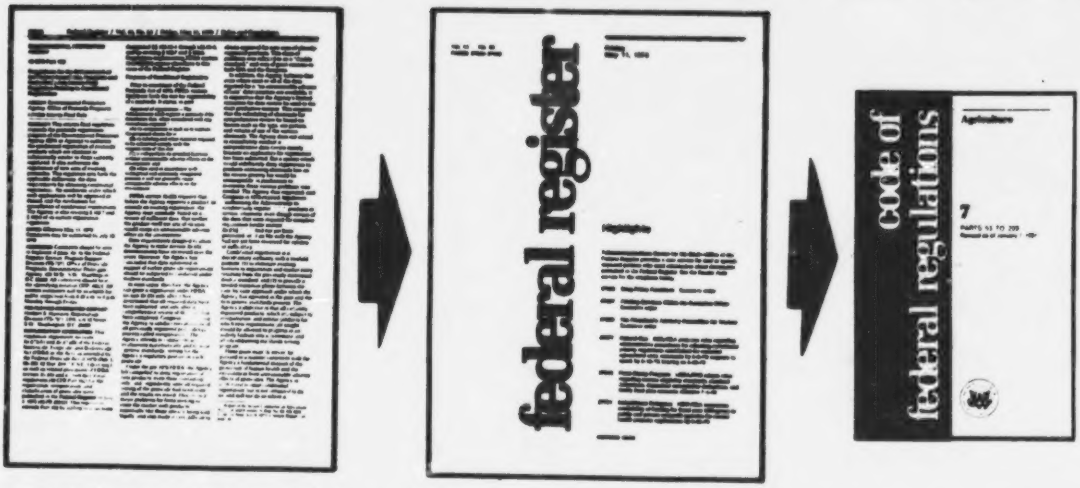

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Title 46—Shipping

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AUTHORITY: Sec. 2, 45 Stat. 1493, as amended, sec. 2, 49 Stat. 888, as amended, sec. 6(b)(1), 80 Stat. 938; 46 U.S.C. 85a, 88a, 49 U.S.C. 1655(b); 49 CFR 1.46(b) (35 FR 4959). Interpret or apply International Convention on Load Lines, 1966; Treaties and Other International Acts Series 6331, proclaimed Sept. 7, 1967 unless otherwise noted.

Subpart 42.01—Authority and Purpose

§ 42.01-1 Authority for regulations.

(a) The statutory authority to prescribe rules and regulations requiring certain vessels to have and display load line marks indicating the maximum amidship draft to which such vessels may be safely loaded and the certification thereof by the assigning authority is in the act of March 2, 1929, as amended (46 U.S.C. 85-85g), the Coastwise Load Line Act, as amended (46 U.S.C. 88-88i), and subsection 6(b)(1) of the Department of

Transportation Act (49 U.S.C. 1655(b)).

(b) The governing requirements for load line marks and their certification for certain vessels engaged on foreign voyages or international voyages other than Great Lakes voyages are in the International Convention on Load Lines, 1966 (hereinafter referred to as the 1966 Convention). The President on September 7, 1967, issued a Proclamation stating that the International Convention on Load Lines, 1966, on and after July 21, 1968, shall be observed and fulfilled with good faith by the United States of America and by the citizens of the United States and all other persons subject to the jurisdiction thereof. For the United States this 1966 Convention supersedes on July 21, 1968, the International Load Line Convention, London, 1930 (hereinafter referred to as the 1930 Convention) (see Articles 16, 24, and 28 of the 1966 Convention).

(c) In Article 1 of the International Convention on Load Lines, 1966, is stated the general obligation under this Convention of each Contracting Government. All measures which may be necessary to give effect to the 1966 Convention are required for vessels on international voyages. The word "Administration" as used in the 1966 Convention is defined in Article 2(2) thereof as meaning "* * * the Government of the State whose flag the ship is flying." For the United States of America, the Commandant, U.S. Coast Guard, superintends the administration and enforcement of the 1966 Convention. The Commandant also exercises the control provisions in the 1966 Convention applicable to vessels subject thereto when on waters subject to the jurisdiction of the United States. (See 14 U.S.C. 2, 632, 46 U.S.C. 2, 372.)

[CGFR 68-60, 33 FR 10048, July 12, 1968, as amended by CGFR 68-126, 34 FR 9011, June 5, 1969]

§ 42.01-5 Assignment of functions.

(a) The Department of Transportation Act (Pub. L. 89-670, 80 Stat. 931-950, 49 U.S.C. 1651-1659), transferred to and vested in the Secretary of Transportation "* * * all functions, powers, and duties, relating to the Coast Guard, of the Secretary of the Treasury and of other officers and offices in the Department of the Treasury" (subsection 6(b)(1), 49 U.S.C. 1655(b)), which included all functions, powers, and duties pertaining to load line marks and their certification. This transfer is subject to certain conditions, modifications, and exceptions as set forth in such act. By a rule in 49 CFR 1.4(a) the Secretary of Transportation delegated to the Commandant, U.S. Coast Guard, authority to exercise certain functions, powers, and duties as set forth in subsections 6(a)(4), 6(b)(1), and 6(g) of such act (49 U.S.C. 1655), subject to conditions, exceptions, and modifications as described in 49 CFR Part 1. By a rule in 49 CFR 1.9 the Secretary of Transportation continued in effect actions taken prior to April 1, 1967.

(b) The Commandant, U.S. Coast Guard, in a notice dated March 31, 1967, and effective April 1, 1967 (32 FR 5611), approved the continuation of orders, rules, regulations, policies, procedures, privileges, waivers, and other actions, which had been made, allowed, granted, or issued prior to April 1, 1967, and provided that they shall continue in effect according to their terms until modified, terminated, repealed, superseded, or set aside by appropriate authority.

[CGFR 68-60, 33 FR 10048, July 12, 1968]

§ 42.01-10 Purpose of regulations.

(a) The load line marks when placed on a vessel shall indicate the maximum amidships draft to which such vessel can be lawfully submerged, in the various circumstances and seasons applicable to such vessel.

(b) The purpose of the rules and regulations in this subchapter is to set forth the uniform minimum requirements for required load line marks for the various categories of vessels when engaged on specific types of voyages, which by law or the International Convention on Load Lines, 1966, require appropriate load lines, and surveys related thereto, their certification by authorized issuing authorities, and the carriage of required certificates aboard the respective vessels involved at all times.

(c) The rules and regulations in this subchapter also provide for the enforcement of load line requirements and control over vessels when it is believed such vessels may be in violation of applicable load line requirements.

[CGFR 68-60, 33 FR 10049, July 12, 1968, as amended by CGFR 68-126, 34 FR 9011, June 5, 1969]

Subpart 42.03—Application

§ 42.03-1 Establishment of load lines.

(a) Load lines are established for merchant vessels of 150 gross tons or over in conformity with the act of March 2, 1929, as amended (46 U.S.C. 85-85g), and the Coastwise Load Line Act, 1935, as amended (46 U.S.C. 88-88i).

(b) Load lines are established under the International Convention on Load Lines, 1966, for (1) vessels registered in the United States; (2) vessels registered in U.S. territories to which the Convention is extended under Article 32 thereof; and (3) unregistered vessels flying the U.S. flag; when such vessels are engaged on international voyages: *Provided,* That such requirements shall not apply to: (i) Ships of war; (ii) new vessels of less than 79 feet in length; (iii) existing vessels of less than 150 gross tons; (iv) pleasure yachts not engaged in trade; and (v) fishing vessels: *Provided, further,* That loadline requirements in this part derived solely from the 1966 Convention do not apply to vessels navigating the Great Lakes of North America (see § 42.05-40); *Provided, further,* That loadline requirements for vessels that operate solely on waters of the Great Lakes, including the St. Lawrence River, are contained in Part 45 of this subchapter.

NOTE: Load lines are not established for vessels solely engaged on voyages on inland navigable waters of the United States (rivers, inland lakes, etc.); i.e., for vessels that, in the usual course of their employment, do not pass outside the line dividing inland waters from the high seas as defined in section 151 of Title 33, United States Code, and implementing regulations in 46 CFR Part 7. Load line requirements for vessels which operate solely on waters of the Great Lakes, including the St. Lawrence River, are contained in Part 45 of this subchapter.

[CGFR 68-60, 33 FR 10049, July 12, 1968, as amended by CGD 73-49R, 38 FR 12289, May 10, 1973 ; CGD 77-1186, 42 FR 35796, July 11, 1977]

§ 42.03-5 U.S.-flag vessels subject to the requirements of this subchapter.

(a) *Vessels engaged in foreign voyages or international voyages other than solely Great Lakes voyages.* (1) All U.S.-flag vessels as specified in § 42.03-1(b) and with exceptions as indicated, which engage in foreign voyages or international voyages by sea (other than solely in Great Lakes voyages) shall be subject to the applicable provisions of this Part.

(2) As provided in Article 4(4) of the 1966 Convention, in order for existing vessels to take advantage of any reduction in freeboards from those previously assigned, the regulations in Subparts 42.13 to 42.25, inclusive, of this part shall be fully complied with. Except for due cause, such vessels shall not be required to increase their freeboards under the provisions of the 1966 Convention.

(3) All U.S.-flag vessels authorized to engage in foreign or international voyages may also engage in domestic voyages by sea and, as permitted by § 45.01-75 of this subchapter, in Great Lakes voyages without additional load line marks and/or certificates. Where additional load line marks and certificates are provided to specifically cover "Great Lakes" or "Special Service, Coastwise" operation, such vessels are subject to the applicable provisions of Parts 44 and 45 of this subchapter.

(b) *Vessels engaged in domestic voyages by sea.* (1) All U.S.-flag vessels which engage in domestic voyages by sea (coastwise and intercoastal voyages) shall be subject to the applicable provisions of this part except the following:

(i) Merchant vessels of less than 150 gross tons.

(ii) Vessels which are mechanically propelled and numbered by a State or the Coast Guard under the Federal Boating Act of 1958 (46 U.S.C. 527-527g), and not required by other laws to be inspected and certificated by the Coast Guard. (This exception includes all mechanically propelled vessels of less than 150 gross tons, and uninspected motor propelled oceanographic vessels of less than 300 gross tons while operating pursuant to section 445 of Title 46, United States Code.)

(iii) Pleasure craft not used or engaged in trade or commerce.

(iv) Barges of less than 150 gross tons.

(v) Vessels engaged exclusively in voyages on waters within the United States or its possessions and which are determined not to be "coastwise" or "Great Lakes" voyages.

(vi) Ships of war.

(vii) U.S. public vessels other than those vessels of 150 gross tons or over and engaged in commercial activities.

(2) In order for existing vessels to take advantage of any reduction in freeboards from those previously assigned, paragraph (a)(2) of this section applies.

(c) *Vessels engaged solely on Great Lakes voyages.* A U.S. flag vessel 79 feet and more and 150 gross tons or over that engages solely on Great Lakes voyages is subject to the applicable provisions of this Part and Part 45 of this subchapter and must comply with the regulations in force on the date the keel is laid or a similar progress in construction is made.

(d) *Special service coastwise voyage.* A U.S. flag vessel 150 gross tons or over that engages in a "special service coastwise voyage" is subject to the applicable provisions of this part and part 44 of this subchapter.

[CGFR 68–60, 33 FR 10049, July 12, 1968, as amended by CGFR 68–126, 34 FR 9011, June 5, 1969; CGD 73–49R, 38 FR 12289, May 10, 1973]

§ 42.03–10 Foreign vessels subject to requirements of this subchapter.

(a) *General.* All foreign merchant vessels of 150 gross tons or over, loading at or proceeding to sea from any port or place within the United States or its possessions for a foreign voyage by sea, or arriving within the jurisdiction of the United States or its possessions from a foreign voyage by sea, in both cases the Great Lakes excepted, are subject to the act of March 2, 1929, as amended (46 U.S.C. 85–85g), and the regulations in this Part applicable to such service. All foreign merchant vessels of 150 gross tons or over, loading at or proceeding from any port or place within the United States on the Great Lakes of North America, or arriving within the jurisdiction of the United States on the Great Lakes, are subject to the Coastwise Load Line Act, 1935, as amended (46 U.S.C. 88–88i), and the regulations in Part 45 of this subchapter applicable to such service.

(b) *Canadian vessels.* All vessels of Canadian registry and holding valid certificates issued pursuant to Canadian laws and regulations are assumed to be in compliance with the applicable provisions of the act of March 2, 1929, as amended (46 U.S.C. 85–85g) and the Coastwise Load Line Act, 1935, as amended (46 U.S.C. 88–88i), the International Convention on Load Lines, 1930, until July 21, 1970, and the regulations in this subchapter, as permitted by section 5 of said laws.

(c) *Vessels of countries signatory to or adhering to the 1966 Convention.* The enforcement and control of load line requirements regarding vessels of countries signatory to or adhering to the 1966 Convention shall be as described in § 42.07–60 in this Part, which is in accord with the provisions of Article 21 of the 1966 Convention. Such vessels when holding currently valid certificates issued pursuant to the 1966 Convention, or recognized under such Convention, are assumed to be in compliance with the applicable provisions of such Convention. Such vessels are deemed to be in compliance with load line requirements found to be equally effective as those established in this Part and therefore in compliance with the applicable load line provisions of the act of March 2, 1929, as amended, the Coastwise Load Line Act, 1935, as amended, and the regulations in this Part as authorized by such laws. Vessels engaged in navigation on the Great Lakes are subject to application of seasonal international marks as specified in Part 45 of this subchapter.

(d) *Vessels of countries not signatory to or adhering to the 1966 Convention.* (1) Vessels of countries not signatory to or adhering to the 1966 Convention, when within the jurisdiction of the

United States shall be subject to the act of March 2, 1929, as amended, the Coastwise Load Line Act, 1935, as amended, and the regulations in this subchapter as authorized by such laws.

(2) Vessels of countries signatory to or adhering only to the 1930 Convention, and holding valid certificates issued under that Convention prior to July 21, 1968, shall be recognized only until July 21, 1970, or until they expire, whichever date occurs first, or for such additional period as may be applicable under Article 16(4) of the 1966 Convention and § 42.05-50. After the date governing application to a specific merchant vessel of 150 gross tons or over, when within the jurisdiction of the United States, such vessel shall be subject to the applicable law described in paragraph (a) of this section and the regulations prescribed thereunder in this subchapter.

[CGFR 68-60, 33 FR 10049, July 12, 1968]

§ 42.03-15 The Great Lakes of North America.

(a) The term "Great Lakes of North America" means those waters of North America which are defined in § 42.05-40, and in the exception in Article 5(2)(a) of the 1966 Convention.

(b) The expressions in the regulations in this part, such as "voyages by sea," "proceed to sea," "arrive from the high seas," etc., shall be construed as having no application to voyages on the Great Lakes or portions thereof unless specifically provided otherwise in Part 45 of this subchapter.

[CGFR 68-60, 33 FR 10050, July 12, 1968]

§ 42.03-17 Special load line marks for vessels carrying timber deck cargo.

(a) Certain vessels having load line marks not related to carriage of timber deck cargo may be assigned timber load lines if they are in compliance with the applicable requirements governing timber deck cargoes in this subchapter. The timber load lines apply and may be used only when the vessel is carrying timber deck cargo.

(b) A new or existing vessel having timber load lines assigned to it, when carrying timber deck cargo, may be loaded to the vessel's timber load line applicable to the voyage and season.

(c) When an existing vessel does not completely meet the applicable requirements in §§ 42.13-1 to 42.20-75, inclusive, and the owner requests the load line assigning authority for timber load lines, then the applicable requirements for timber load lines in Part 43 of this subchapter shall be met before assigning such timber load lines.

[CGFR 68-60, 33 FR 10050, July 12, 1968]

§ 42.03-20 Equivalents.

(a) Where in this subchapter it is provided that a particular fitting, material, appliance, apparatus, or equipment, or type thereof, shall be fitted or carried in a vessel, or that a particular provision shall be made or arrangement shall be adopted, the assigning authority, with the prior approval of the Commandant, may accept in substitution therefor any other fitting, material, apparatus, or equipment or type thereof, or any other provision or arrangement: *Provided*, That it can be demonstrated by trial thereof or otherwise that the substitution is at least as effective as that required by the regulations in this subchapter.

(b) In any case where it is shown to the satisfaction of the assigning authority and the Commandant that the use of any particular equipment, apparatus, or arrangement not specifically required by law is unreasonable or impracticable, appropriate alternatives may be permitted under such conditions as are consistent with the minimum standards set forth in this subchapter.

[CGFR 68-60, 33 FR 10050, July 12, 1968]

§ 42.03-25 Experimental installations.

(a) Complete information (including plans, necessary instructions and limitations, if any) on proposed experimental installations affecting any fitting, material, appliance, apparatus, arrangement, or otherwise shall be submitted to the assigning authority for evaluation. After acceptance by the assigning authority, the complete information of such installation shall be forwarded to the Commandant for specific approval prior to installation. Complete information shall also be furnished for any associated installation(s) deemed necessary to prevent endangering the vessel during the trial period of proposed experimental installations.

(b) The use of approved experimental installations shall be permitted only when in accordance with instructions and limitations as specifically prescribed for such installations by the Commandant.

[CGFR 68–60, 33 FR 10050, July 12, 1968]

§ 42.03–30 Exemptions for vessels.

(a) For an individual vessel or category of vessels, upon the specific recommendation of the assigning authority, the Commandant may authorize an exemption from one or more load line requirements. Such recommendation and authorization will depend upon provision of any additional features as deemed necessary by the authorities to ensure the vessel's safety in the services and under the conditions specified in paragraph (b) of this section.

(b) Exemptions from specific load line requirements for vessels meeting requirements of paragraph (a) of this section are authorized, subject to certain conditions, including type of voyage engaged in, as follows:

(1) For vessels engaged on international voyages between the United States and near neighboring ports of its possessions or of foreign countries. The exemptions may be permitted because the requirements are deemed to be unreasonable or impracticable due to the sheltered nature of the waters on which the voyages occur or other conditions. These exemptions shall be valid only so long as such a vessel shall remain engaged on specific designated voyages. If the voyage involves a foreign country or countries, the United States will require an exemption agreement with such country or countries prior to the issuance of the appropriate load line certificate.

(2) For vessels engaged on international voyages which embody features of a novel kind, and where nonexemption may seriously impede research, development, and incorporation of novel features into vessels. If the voyage or voyages intended involve a foreign country or countries, then the United States will require an exemption agreement with such country or countries prior to the issuance of a Load Line Exemption Certificate. If the Commandant grants an exemption pursuant to this paragraph (b)(2) to a U.S. flag vessel that operates on the Great Lakes of North America, he may notify the Chairman of the Board of Steamship Inspection of Canada of the nature of the exemption, but no special exemption certificate is issued.

(3) For a vessel not normally engaged on international voyages but which is required to undertake a single international voyage under exceptional circumstances.

(c) A vessel given one or more exemptions from load line requirements under the provisions of paragraph (b)(1) of this section will be issued the appropriate load line certificate, using Form A1, A2, or A3. In each case the exemptions shall be specified on the load line certificate together with the Convention authority which authorizes such exemptions.

(d) A vessel given one or more exemptions under the provisions of paragraph (b) (2) or (3) of this section will be issued a Load Line Exemption Certificate, using Form E1. This certificate shall be in lieu of a regular load line certificate, and the vessel shall be considered as in compliance with applicable load line requirements.

(e) The Commandant may exempt from any of the requirements of this part a vessel that engages on a domestic voyage by sea or a voyage solely on the Great Lakes and embodies features of a novel kind, if the novel features and any additional safety measures required are described on the face of the issued certificate.

(f) A vessel that is not usually engaged on domestic voyages by sea or on voyages on the Great Lakes but that, in exceptional circumstances, is required to undertake a single such voyage between two specific ports is—

(1) Subject to the Coastwise Load Line, Act, as amended and the applicable regulations of this subchapter; and

(2) Issued a single voyage load line authorization by the Commandant that states the conditions under which the voyage may be made and any addi-

tional safety measures required for a single voyage.

[CGFR 68-126, 34 FR 9011, June 5, 1969, as amended by CGD 73-49R, 38 FR 12289, May 10, 1973]

§ 42.03-35 U.S.-flag vessels and Canadian vessels navigating on sheltered waters of Puget Sound and contiguous west coast waters of United States and Canada.

(a) In a Treaty between the United States and Canada proclaimed on August 11, 1934, the respective Governments were satisfied of the sheltered nature of certain waters of the west coast of North America. It was agreed to exempt vessels of the United States and Canadian vessels from load line requirements when such vessels engage on international voyages originating on, wholly confined to, and terminating on such waters. In Article I of this Treaty these waters are described as follows: "* * * the waters of Puget Sound, the waters lying between Vancouver Island and the mainland, and east of a line from a point 1 nautical mile west of the city limits of Port Angeles in the State of Washington to Race Rocks on Vancouver Island, and of a line from Hope Island, British Columbia, to Cape Calvert, Calvert Island, British Columbia, the waters east of a line from Cape Calvert to Duke Point on Duke Island, and the waters north of Duke Island and east of Prince of Wales Island, Baranof Island, and Chicagof Island, the waters of Peril, Neva, and Olga Straits to Sitka, and the waters east of a line from Port Althorp of Chicagof Island to Cape Spencer, Alaska, are sheltered waters * * *."

(b) U.S.-flag vessels and Canadian vessels navigating on the treaty waters on a voyage as described in paragraph (a) of this section are by virtue of this Treaty of August 11, 1934, not subject to load line requirements in the load line acts, the 1966 Convention, and the regulations in this subchapter. Vessels navigating these sheltered waters and passing outside their boundary on any voyage cannot claim the benefits of this Treaty and shall be in compliance with the applicable load line requirements in the load line acts, the 1966 Convention, and the regulations in this subchapter.

(c) Since subdivision requirements apply to all passenger vessels subject to the 1960 International Convention on Safety of Life at Sea, those passenger vessels navigating on the waters described in paragraph (a) of this section shall be in compliance with such 1960 Convention requirements and the regulations in Part 46 of this subchapter. The Coast Guard issues to such a vessel a stability letter. The assigning authority is authorized to issue to such a passenger vessel an appropriate load line certificate, modified to meet the conditions governing her service assignment, and marking.

[CGFR 68-60, 33 FR 10051, July 12, 1968, as amended by CGFR 68-126, 34 FR 9011, June 5, 1969]

Subpart 42.05—Definition of Terms Used in This Subchapter

§ 42.05-1 Approved.

This term means approved by the Commandant, U.S. Coast Guard, unless otherwise stated.

[CGFR 68-60, 33 FR 10051, July 12, 1968]

§ 42.05-10 Assigning authority.

This term means the "American Bureau of Shipping" or such other recognized classification society which the Commandant may approve as the load line assigning and issuing authority for a vessel, as provided in sections 3 of the load line acts.

[CGFR 68-60, 33 FR 10051, July 12, 1968]

§ 42.05-20 Commandant.

This term means the Commandant, U.S. Coast Guard, Department of Transportation, Washington, D.C. 20591.

[CGFR 68-60, 33 FR 10051, July 12, 1968]

§ 42.05-25 Coast Guard District Commander or District Commander.

These terms mean an officer of the Coast Guard designated as such by the Commandant to command all Coast Guard activities within his district. This includes enforcement of load line requirements as described in this subchapter.

[CGFR 68-60, 33 FR 10051, July 12, 1968]

§ 42.05–30 Existing vessel.

(a) As used in this Part 42, for a vessel engaged on international voyages or on domestic voyages by sea, the term "existing vessel" means a vessel which is not a new vessel. With few exceptions an "existing vessel" is a vessel the keel of which was laid, or which was at a similar stage of construction, prior to July 21, 1968. (See § 42.05–50 for the definition of a new vessel.)

(b) As used in Part 43 of this subchapter, for a vessel engaged on international voyages, the term "existing vessel" means a vessel whose keel was laid prior to July 1, 1932. (See § 43.01–25 of this subchapter.)

(c) As used in Part 43 of this subchapter, for a vessel engaged on domestic voyages by sea and subject to the Coastwise Load Line Act, 1935, as amended, the term "existing vessel" means one whose keel was constructively laid prior to November 27, 1935, if of 4,000 gross tons or over, and prior to August 27, 1936, if less than 4,000 gross tons. (See § 43.01-25 of this subchapter.)

(d) As used in Part 44 of this subchapter, for a vessel marked with load lines for special service on a coastwise or interisland voyage, the term "existing vessel" means one whose keel was laid prior to September 28, 1937. (See § 44.01-20 of this subchapter.)

(e) As used in Part 45 of this subchapter, "existing vessel" in all regulations pertaining to a vessel engaged solely on Great Lakes voyages before April 14, 1973, means a vessel whose keel was laid before August 27, 1936. The regulations pertaining to these vessels that are in effect after April 14, 1973, do not use the term "existing vessel".

(f) As used in Part 46 of this subchapter, for a passenger vessel marked with subdivision load lines, the term "existing vessel" means a vessel whose keel was laid or was converted to such service prior to May 26, 1965. (See § 46.05–30 of this subchapter.)

[CGFR 68-60, 33 FR 10051, July 12, 1968, as amended by CGD 73-49R, 38 FR 12290, May 10, 1973]

§ 42.05–40 Great Lakes.

(a) This term means the Great Lakes of North America.

(b) As used in this Part, the term "solely navigating the Great Lakes" includes any special service coastwise navigation performed by the vessel.

(c) In concurrence with related Canadian regulations, the waters of the St. Lawrence River west of a rhumb line drawn from Cap de Rosiers to West Point, Anticosti Island, and west of a line along 63° W. longitude from Anticosti Island to the north shore of the St. Lawrence River shall be considered as a part of the Great Lakes. In addition, the Victoria Bridge, Montreal, Canada, is the dividing line between fresh water and salt water in the St. Lawrence River.

[CGFR 68-60, 33 FR 10051, July 12, 1968, as amended by CGD 73-49R, 38 FR 12290, May 10, 1973]

§ 42.05–45 International voyage.

(a) The term "international voyage" as used in this Part shall have the same meaning as the term "international voyage" in Article 2(4) of the 1966 Convention. Except for vessels operating solely on the waters indicated in Article 5(2) of the 1966 Convention, an "international voyage" means a sea voyage from any country to a port outside such country, or conversely. For this purpose, every territory for the international relations of which any specific Contracting Government is responsible or for which the United Nations are the administering authority is regarded as a separate country.

(b) The 1966 Convention does not apply to vessels solely navigating the Great Lakes. Accordingly, such vessels shall not be considered as being on an "international voyage" for the purpose of this subchapter.

(c) For the purpose of administration of load line requirements in this subchapter, the Commonwealth of Puerto Rico, the Territory of Guam, the Virgin Islands, and all possessions and lands held by the United States under a protectorate or mandate shall each be considered to be a "territory" of the United States.

[CGFR 68-60, 33 FR 10051, July 12, 1968]

§ 42.05-47 Marine inspector or inspector.

These terms mean any person from the civilian or military branch of the Coast Guard assigned under the superintendence and direction of an Officer in Charge, Marine Inspection, or any other person as may be designated for the performance of duties with respect to the inspection, enforcement, and administration of Title 52, Revised Statutes, and acts amendatory thereof or supplemental thereto, and rules and regulations thereunder.

[CGFR 68-60, 33 FR 10051, July 12, 1968]

§ 42.05-50 New vessel.

(a) As used in this Part 42, for a vessel engaged on international voyages or on domestic voyages by sea, the term "new vessel" means a vessel, the keel of which is laid, or which is at a similar stage of construction, on or after July 21, 1968. (See § 42.05-[illegible] for definition of an existing vessel.)

(1) This definition applies to all vessels of countries signatory to or acceding to the 1966 Convention prior to April 21, 1968, and to vessels of countries not adhering to an applicable Convention as indicated in Article 16(4) of the 1966 Convention.

(2) For countries which accede to the 1966 Convention after April 21, 1968, a "new vessel" (foreign) shall be one whose keel is constructively laid 3 months or more after such date.

(b) As used in Part 43 of this subchapter, for a vessel engaged on international voyages, the term "new vessel" means one whose keel was laid on or after July 1, 1932, and prior to July 21, 1968. (See § 43.01-25 of this subchapter.)

(c) As used in Part 43 of this subchapter, for a vessel engaged on domestic voyages by sea and subject to the Coastwise Load Line Act, 1935, as amended, a "new vessel" is one whose keel was constructively laid prior to July 21, 1968, and on or after November 27, 1935, if of 4,000 gross tons and over, or on or after August 27, 1936, if less than 4,000 gross tons. (See § 43.01-25 of this subchapter.)

(d) As used in Part 44 of this subchapter, for a vessel marked with load lines for special service on a coastwise or interisland voyage, the term "new vessel" means one whose keel is laid on or after September 28, 1937. (See § 44.01-20 of this subchapter.)

(e) As used in Part 45 of this subchapter, for a vessel engaged solely on Great Lakes voyages, the term "new vessel" means one whose keel is laid on or after August 27, 1936. (See § 45.01-10 of this subchapter.)

(f) As used in Part 46 of this subchapter, for a passenger vessel marked with subdivision load lines, the term "new vessel" means a vessel whose keel is laid or is converted to such service on or after May 26, 1965. (See § 46.05-25 of this subchapter.)

[CGFR 68-60, 33 FR 10051, July 12, 1968]

§ 42.05-55 Officer in Charge, Marine Inspection.

This term means any person from the civilian or military branch of the Coast Guard designated as such by the Commandant and who, under the superintendence and direction of the Coast Guard District Commander, is in charge of a marine inspection zone, and may supervise or perform the duties of a marine inspector.

[CGFR 68-60, 33 FR 10052, July 12, 1968]

§ 42.05-60 Recognized classification society.

The term "recognized classification society" means the American Bureau of Shipping or other classification society recognized by the Commandant, as provided in section 3 of the load line acts, and who also may be approved as a load line assigning and issuing authority.

[CGFR 68-60, 33 FR 10052, July 12, 1968]

§ 42.05-63 Ship(s) and vessel(s).

The terms "ship(s)" and "vessel(s)" are interchangeable or synonymous words, and include every description of watercraft, other than a seaplane on the water, used or capable of being used as a means of transportation on water.

[CGFR 68-126, 34 FR 9011, June 5, 1969]

§ 42.05-65 Surveyor.

The term "surveyor" means any person designated by the American Bureau of Shipping or other classification society recognized by the Commandant as the person who actually examines the vessel and/or materials associated with such examination, and who ascertains such vessel complies with applicable load line requirements.

[CGFR 68-60, 33 FR 10052, July 12, 1968]

Subpart 42.07—Control, Enforcement, and Rights of Appeal

§ 42.07-1 Load lines required.

(a) The vessels listed in §§ 42.03-5 and 42.03-10 as subject to the applicable requirements in this subchapter shall have load lines accurately marked amidships, port and starboard, as provided in this Part 42 or the 1966 Convention, unless otherwise stated. Those vessels issued load line exemption certificates may not be required to have load line marks (see § 42.03-30).

(b) For vessels marked with international load lines and navigating the Great Lakes, such vessels are also subject to requirements in Part 45 of this subchapter while on the Great Lakes. See § 45.9 of this subchapter for load line marks used by such vessels.

(c) For Great Lakes vessels operating solely on Great Lakes voyages, the requirements for the applicable load line marks are in Part 45 of this subchapter. Great Lakes vessels when making other international or unlimited coastwise voyages shall comply with the applicable requirements in Parts 42, 44, and 45 of this subchapter.

(d) For coastwise steam colliers, barges, and self-propelled barges in special services, the requirements for the applicable load line marks are in Part 44 of this subchapter. These requirements also include certain regulations governing such vessels when they additionally engage in Great Lakes voyages, international voyages or unlimited coastwise voyages. Load line requirements in this Part 42 also apply to such vessels when engaged on international or unlimited coastwise voyages.

(e) For existing U.S.-flag vessels, as defined in § 42.05-30(a), and engaged on international or coastwise voyages, the load line requirements set forth in Part 43 of this subchapter may continue to apply, provided:

(1) The vessel has not been assigned a reduced freeboard under the regulations in this Part 42, and

(2) The form of load line certificate issued to and carried on board the vessel conforms to the requirements of § 42.07-45(b)(1).

(f) For foreign vessels of countries signatory to or adhering to the 1966 Convention, the applicable requirements in this Part 42 shall apply on and after July 21, 1968. For foreign vessels of countries adherent to the 1930 Convention, which do accede to the 1966 Convention between April 21, 1968, and April 21, 1970, the applicable requirements in Part 43 of this subchapter may be extended for 27 months beyond the accession date unless the certificate expires during such time, and thereafter such vessels shall be certificated under the 1966 Convention. For foreign vessels of countries adherent to the 1930 Convention, and not acceding to the 1966 Convention, such vessels shall be subject to the applicable requirements in Part 43 until July 21, 1970, and thereafter shall be surveyed, assigned, and certificated as a foreign vessel under the applicable requirements in this Part 42. For foreign vessels not adhering to either the 1930 Convention or the 1966 Convention and subject to the load line acts, the applicable requirements in Parts 42 and 45 shall apply on and after July 21, 1968, except that such vessels holding valid certificates issued under Part 43 of this subchapter on July 21, 1968, may continue under such certificates until they expire or until July 21, 1970, whichever occurs first.

[CGFR 68-60, 33 FR 10052, July 12, 1968, as amended by CGFR 68-126, 34 FR 9011, June 5, 1969; CGD 73-49R, 38 FR 12290, May 10, 1973]

§ 42.07-5 Marks placed on vessel to indicate load lines.

(a) Load line marks to indicate the maximum amidship's draft to which a vessel can be lawfully submerged, in the various circumstances and seasons, shall be permanently marked on each side of the vessel in the form, manner, and location as required by this subchapter.

(b) The load line marks placed on a vessel shall be attested to by a valid load line certificate as required by § 42.07-45(b). The issuing authority shall not deliver any required load line certificate to the vessel until after its surveyor has ascertained that the vessel meets the applicable survey requirements and the correct placement of the marks on the vessel's sides has been confirmed.

(c) The requirements for load line marks apply to all new and existing vessels as specified in §§ 42.03-5 and 42.03-10, except when a vessel has been issued a load line exemption certificate in lieu of a load line certificate.

[CGFR 68-60, 33 FR 10052, July 12, 1968, as amended by CGFR 68-126, 34 FR 9012, June 5, 1969]

§ 42.07-10 Submergence of load line marks.

(a) Except as provided otherwise in this section, vessels of the types described in paragraphs (a)(1) through (a)(3) of this section shall not be so loaded as to submerge at any time when departing for a voyage by sea, or on the Great Lakes, or during the voyage, or on arrival, the applicable load lines marked on the sides of the vessel for the season of the year and the zone or area in which the vessel may be operating.

(1) Merchant vessels of 150 gross tons or over, as described in §§ 42.03-5 or 42.03-10, and on voyages subject to the load line acts.

(2) All new vessels of 79 feet or over in length on voyages subject to the 1966 Convention.

(3) All vessels of 150 gross tons or over, other than merchant vessels covered by paragraph (a)(1) of this section, on voyages subject to the 1966 Convention.

(b) When loading a vessel in a favorable zone for a voyage on which the vessel will enter a less favorable zone, such allowances must be made that the vessel when crossing into the less favorable zone, will conform to the regulations and freeboard for the less favorable zone.

(c) When a vessel is in fresh water of unit density, the appropriate load line may be submerged by the amount of the fresh water allowance shown on the applicable load line certificate. Where the density is other than unity, an allowance shall be made proportional to the difference betwen 1.025 and the actual density. This paragraph does not apply to vessels when navigating the Great Lakes.

(d) When a vessel departs from a port situated on a river or inland waters, deeper loading shall be permitted corresponding to the weight of fuel and all other materials required for consumption between the port of departure and the sea. This paragraph does not apply to vessels when navigating the Great Lakes.

[CGFR 68-60, 33 FR 10052, July 12, 1968, as amended by CGFR 68-126, 34 FR 9012, June 5, 1969]

§ 42.07-15 Zones and seasonal areas.

(a) A vessel subject to the load line acts or the 1966 Convention shall comply, as applicable, with the requirements regarding the zones and seasonal areas described in Subpart 42.30.

(b) A port located on the boundary line between two zones or areas shall be regarded as within the zone or seasonal area from or into which the vessel arrives or departs.

[CGFR 68-60, 33 FR 10053, July 12, 1968]

§ 42.07-20 Logbook entries.

(a) As described in § 3.13-35 of Subchapter A (Procedures Applicable to the Public) of this chapter, official logbooks (Form CG-706-C), are furnished free to certain vessels, and after they have served their purpose they are filed with the applicable Officer in Charge, Marine Inspection.

(b) The master shall be responsible for having entered in the vessel's "official logbook" if carried, otherwise in his own log considered as its official logbook, the data required by section 6 of the load line acts. These logbooks entries shall be made before a vessel departs from her loading port or place and consist of:

(1) A statement of the load line marks applicable to the voyage; and,

(2) A statement of the position of the load line marks, port and starboard, at the time of departing from a port or place; i.e., the distance in inches of the water surface above or below the applicable load line; and,

(3) The actual drafts of the vessel, forward and aft, as nearly as the same can be ascertained, at the time of departing from a port or place.

(c) Where the master uses his own log, it shall be kept by the master or owner for 1 year after the actions noted therein have been completed and upon request shall be furnished to any load line enforcement officer.

[CGFR 68-60, 33 FR 10053, July 12, 1968]

§ 42.07-25 Approval of the Commandant.

(a) Where the requirements in this subchapter state that the approval of the Commandant is necessary, the owner or his agent shall furnish all information necessary, including background material, and/or final plans, calculations, and conclusions reached, as will enable the Commandant to obtain a comprehensive understanding of and reach a decision relative to the question or problem at issue prior to proceeding with the work. All information, plans and calculations submitted will remain with the Commandant as a part of the record on the vessel.

(b) If the owner or his agent desires to have information, plans, and calculations returned with Commandant's actions noted thereon, or if distribution of such information is necessary or required by regulations in this subchapter to owners, masters of vessels, etc., then the owner or his agent shall furnish multiple copies of the information as required.

[CGFR 68-60, 33 FR 10053, July 12, 1968]

§ 42.07-30 Approval of the assigning authority.

(a) Where the requirements in this subchapter state the approval of an assigning authority is required, the owner or his agent shall furnish the required information, including plans, etc., as required by and which will enable the assigning authority to obtain a comprehensive understanding of the matter and to reach pertinent decisions prior to proceeding with the work. When requested the assigning authority shall furnish the Coast Guard all information, etc., on any question at issue and decisions reached.

(b) All information required under this subchapter by an assigning authority with respect to a specific vessel shall be retained until 5 years after termination of certification by such authority.

[CGFR 68-60, 33 FR 10053, July 12, 1968]

§ 42.07-35 American Bureau of Shipping as an assigning authority.

(a) The American Bureau of Shipping, with its home office at 45 Broad Street, New York, N.Y. 10004, is hereby appointed as the prime assigning and issuing authority under the provisions of Articles 13 and 16(3) of the 1966 Convention and as directed by sections 3 of the load line acts. In this capacity the American Bureau of Shipping is empowered to assign load lines, to perform surveys required for load line assignments, and to determine that the position of and the manner of marking vessels has been done in accordance with applicable requirements.

(b) On behalf of the United States of America, the American Bureau of Shipping is authorized to issue or reissue, under its own seal and signature of its officials, the appropriate load line certificates or International Load Line Exemption Certificate as described in Subpart 42.50 of this Part or in Parts 44 to 46, inclusive, of this subchapter. Except for the International Load Line Exemption Certificate, the required load line certificate issued to a specific vessel shall certify to the correctness of the load line marks assigned and marked on the vessel and compliance with authorized conditions, restrictions, and/or exemptions, if any. The International Load Line Exemption Certificate when issued to a vessel shall certify as to the compliance with the information applicable to the vessel.

(c) The designation and delegation to the American Bureau of Shipping as an assigning and issuing authority shall be in effect indefinitely unless for due cause it shall be terminated by proper authority and notice of cancellation is published in the FEDERAL REGISTER.

(d) The American Bureau of Shipping is authorized to revalidate from time to time by endorsement a load line certificate or an International Load Line Exemption Certificate.

(e) Before revalidating any certificate by endorsement, the American Bureau of Shipping shall verify that the required load line marks assigned are marked on the vessel and the vessel is in compliance with authorized conditions, restrictions, and/or exemptions, if any.

(f) The American Bureau of Shipping shall issue all load line certificates in duplicate; one copy shall be delivered to the owner or master of the vessel, and one copy (together with a summary of data used to determine the assigned load lines) shall be forwarded to the Commandant.

(g) The American Bureau of Shipping shall prepare a load line survey report on each new vessel or existing vessel when brought into complete compliance with this part prior to issuing the required load line certificate described in Subpart 42.50 of this Part. At the time the certificate is delivered, one copy of this report shall be delivered to the master of the vessel, and one copy shall be forwarded to the Commandant. When a load line survey report is superseded or revised, one copy shall be delivered to the master of the vessel, and one copy shall be forwarded to the Commandant.

(h) The load line survey report or stability information furnished to a specific vessel shall include a statement of the locations of all watertight subdivision bulkheads, including steps or recesses therein, which may be involved in the vessel's load line assignment.

(i) The authorized scale of maximum fees payable to the American Bureau of Shipping as an assigning and issuing authority is set forth in Subpart 42.35 of this Part.

[CGFR 68-60, 33 FR 10053, July 12, 1968, as amended by CGFR 68-126, 34 FR 9012, June 5, 1969]

§ 42.07-40 Recognized classification society as an assigning authority.

(a) On behalf of the United States of America, under the provisions of Articles 13 and 16(3) and as provided in sections 3 of the load line acts, the Commandant, at the request of a shipowner, may appoint any other recognized classification society, which he may approve, as the assigning and issuing authority who shall perform the same functions and duties as indicated in § 42.07-35 for the American Bureau of Shipping.

(b) The appointment of a recognized classification society as the assigning and issuing authority will be limited to vessels specifically designated by the Commandant.

[CGFR 68-60, 33 FR 10053, July 12, 1968]

§ 42.07-43 Change in assigning authority.

(a) If the owner desires a change in assigning and issuing authority for a vessel, a special request shall be made in writing to the Commandant at least 90 days prior to the expiration date of the present certificate or the annual endorsement thereon.

(b) A change in the assigning authority does not presume any change in assigned load lines.

[CGFR 68-60, 33 FR 10053, July 12, 1968]

§ 42.07-45 Load line certificates.

(a) The load line certificates for which the Government of the United States of America assumes full responsibility may be issued by the Commandant, the American Bureau of Shipping, or a recognized classification society when appointed as an authorized assigning and issuing authority for specifically designated vessels.

(b) The load line certificate shall certify to the correctness of the load line marks assigned to the vessel and that the vessel is in compliance with applicable requirements. A certificate issued under this subchapter also shall describe the applicable load line marks, conditions, restrictions, and/or exemptions, if any, the vessel shall observe, according to the season of the year and the zone or area in which the vessel may operate. The load line exemption certificate issued under § 42.03–30 shall certify the special conditions the vessel shall observe.

(1) For U.S.-flag vessels on international voyages, and holding valid certificates issued pursuant to Part 43 of this subchapter prior to July 21, 1968, the period of validity of such certificates shall be until July 21, 1970, or until date of expiration, whichever shall occur first. For the other U.S.-flag vessels holding valid certificates issued pursuant to Parts 43 to 46, inclusive, prior to July 21, 1968, there is no change in the period of validity and they remain in effect to the date of expiration. Certificates issued after July 21, 1968, to U.S.-flag vessels shall be on the applicable forms described in Subpart 42.50 of this Part or in Parts 44 to 46, inclusive, of this subchapter.

(2) For foreign vessels holding valid 1930 Convention certificates on July 21, 1968, such certificates shall be accepted until July 21, 1970, or for such other periods which may apply to foreign vessels of specific countries as described in § 42.07–1(f).

(c) A load line assignment and certificate issued to any vessel under the authority of the regulations in this subchapter (or under the authority of any Government adhering to the 1966 Convention, under the provisions of Article 19(5) of the 1966 Convention) shall cease to be valid upon the transfer of such vessel to the flag of another Government.

(d) Each loadline certificate is issued for the following length of time:

(1) An international and coastwise certificate is issued for 5 years and may be extended by the Commandant up to 150 days from the date of the—

(i) Survey that is endorsed on the certificate by the surveyor authorized by the Coast Guard; or

(ii) Last day of the 5-year period.

(2) A Great Lakes certificate is issued for 5 years and may be extended by the Commander, Ninth Coast Guard District up to 90 days from the date of the—

(i) Survey that is endorsed on the certificate by the surveyor authorized by the Coast Guard; or

(ii) Last day of the 5-year period.

(e) The form of certificate certifying to the correctness of the load line marks, assigned under the regulations in this Part, may be in the form of temporary or provisional certificate, signed by the authorized surveyor pending early issuance of appropriate certificate as shown in Subpart 42.50 of this Part as follows:

(1) International Load Line Certificate, 1966, issued to U.S. vessels engaged in foreign voyages, or engaged in coastwise or intercoastal voyages (provided such vessels qualify to engage in foreign voyages without restriction), as follows:

(i) Form *A1*, For general use.

(ii) Form *A2*, For sailing vessels.

(iii) Form *A3*, For general use, combined with timber deck cargo.

(2) Certificate issued to foreign vessels belonging to countries that have not ratified or acceded to the 1966 Convention or the 1930 Convention so long as applicable, as follows:

(i) Form *B*, For general use.

(3) Coastwise load line certificate (other than for special service as provided for by Part 44 of this subchapter) issued to U.S. vessels engaged solely in coastwise and/or intercoastal voyages (which may be subject to restrictions as to manning, routes, seasons, waters of operations, etc., as shown on the face of the certificate), as follows:

(i) Form *C1*, For general use.

(ii) Form *C2*, For sailing ships.

(iii) Form *C3*, For general use, combined with timber deck cargo.

(f) The form of certificate certifying to the correctness of exemptions granted under the regulations in this part shall be as shown in Subpart 42.50 of this Part as follows:

(1) International load line exemption certificate issued under special conditions to U.S.-flag vessels engaged in foreign voyages, as follows:

(i) Form *E1*, For general international use.

(ii) Where this certificate is intended to expire after a single voyage, this information shall be noted on the face of the certificate.

(2) International load line certificate Form A1, A2, or A3 issued under special conditions to U.S.-flag vessels on international voyages between the United States and near neighboring ports of its possessions or of foreign countries. Exemptions, if any, shall be specified on the certificate.

(g) The issuing authority shall provide the printed forms it may use under the regulations in this subchapter. These forms shall be approved by the Commandant before final printing. The international load line certificate and exemption certificate forms shall exactly reproduce the arrangement of the printed part of the model Forms *A1, A2, A3,* and *E1* indicated in Subpart 42.50 of this Part for all official copies and any certified copies issued.

(h) Where a vessel qualifies for and is issued a Form E1 International Load Line Exemption Certificate for foreign voyages but is also or solely engaged in coastwise or intercoastal voyages by sea, this certificate shall be considered equivalent to a valid coastwise load line certificate. In such case the vessel shall be deemed in full compliance with the Coastwise Load Line Act and the regulations in this Part promulgated thereunder.

[CGFR 68-60, 33 FR 10054, July 12, 1968, as amended by CGFR 68-126, 34 FR 9012, June 5, 1969; CGD 73-49R, 38 FR 12290, May 10, 1973; CGD-74; 153, 39 FR 25324, July 10, 1974]

§ 42.07-50 Penalties for violations.

(a) The penalties for violation of various provisions of the load line acts or the regulations established thereunder are set forth in Title 46, United States Code, sections 85g and 88g. The Secretary of Transporation by 49 CFR 1.4(a) has transferred to the Commandant authority to assess, collect, remit or mitigate any monetary penalty imposed under these laws.

(b) The master and/or owner of a vessel that is operated, navigated, or used in violation of the provisions of the load line acts, or the regulations in this subchapter will be subject to the penalties as set forth in law, and the vessel shall also be liable therefor. Depending upon the gravity of the violations, the Coast Guard may do any one or more of the following:

(1) Detain a vessel if deemed to be overloaded in violation of Title 46, United States Code, section 85c or 88c, in accordance with section 85f or 88f, and have the vessel surveyed by three disinterested surveyors.

(2) Assess and collect applicable monetary penalties for certain violations as provided in Title 46, United States Code, sections 85g and 88g.

(3) Initiate criminal prosecution for certain violations when required by Title 46, United States Code, section 85g or 88g.

(4) Initiate an action of libel against the vessel involved if there is a failure to pay monetary penalties assessed.

(5) Initiate a suspension or revocation proceeding, in addition to the foregoing actions described in this paragraph against any officer or seaman holding a valid Coast Guard license or merchant mariner's document and who may violate any provision of the load line acts, the 1966 Convention, or the regulations in this subchapter, under the provisions of Title 46, United States Code, section 239, and the regulations prescribed thereunder in Part 137 of Subchapter K (Marine Investigations and Suspension and Revocation Proceedings) of this chapter.

(c) In determining offenses the provisions of Title 46, United States Code, sections 85g and 88g, both provide that "Each day a vessel is in violation of this act shall constitute a separate offense."

(d) The procedures governing the assessment, collection, remission and mitigation of any monetary penalty imposed under Title 46, United States Code, section 85g or 88g, for a violation of either load line law or the applicable regulations in this subchapter, as well as the appeal procedures to be followed, are in Subpart 2.50 of Subchapter A (Procedures Applicable to the Public) of this chapter.

[CGFR 68-60, 33 FR 10054, July 12, 1968, as amended by CGFR 68-126, 34 FR 9012, June 5, 1969]

§ 42.07-55 Cancellation of load line certificates or exemption certificates.

(a) Since vessels described in § 42.03-5 or § 42.03-10 when found qualified are issued appropriate load line certificates or load line exemption certificates, under U.S. responsibility as indicated in § 42.07-45 such certificates may be canceled by proper U.S. authority for due cause, including one or more of the causes listed in paragraph (b) of this section. Such action may occur prior to the expiration date on the certificate and normal certificate surrender. The cancellation of such certificate means that the correctness of load line marks and compliance with conditions of assignment for the named vessel no longer are recognized by the United States and that the existing assigned load line marks are voided.

(b) Certain causes for automatic cancellation of certificates are:

(1) The conditions of assignment have not been maintained as required by this subchapter.

(2) Material alterations have taken place in the hull or superstructure of the vessel, which will necessitate the assignment of an increased freeboard.

(3) The fittings and appliances have not been maintained in an effective condition for the protection of openings, guardrails, freeing ports, and means of access to crew's quarters.

(4) The structural strength of the vessel is lowered to such an extent that the vessel is unsafe.

(5) The load line certificate or International Load Line Exemption Certificate is not endorsed to show the vessel has been surveyed annually or periodically by the issuing authority as required by this Part or the 1966 Convention.

(6) Issuance of a new load line certificate for the same vessel.

(7) Surrender of a certificate for cancellation when required.

(8) The owner, master, or agent of the vessel has furnished false or fraudulent information in or with the application for a certificate.

[CGFR 68-60, 33 FR 10054, July 12, 1968, as amended by CGFR 68-126, 34 FR 9012, June 5, 1969]

§ 42.07-60 Control.

(a) The District Director of Customs or the Coast Guard District Commander may detain a vessel for survey if there is reason to believe that the vessel is proceeding on her journey in excess of the draft allowed by the regulations in this subchapter as indicated by the vessel's load line certificate, or otherwise. The Coast Guard District Commander may detain a vessel if it is so loaded as to be manifestly unsafe to proceed to sea.

(b) If the District Director of Customs orders a vessel detained, he shall immediately inform the Coast Guard District Commander thereof, who shall thereupon advise the District Director of Customs whether or not he deems that the vessel may proceed to sea with safety. If the Coast Guard District Commander orders a vessel detained, such officer will furnish the District Director of Customs immediate notification of such detention. The clearance shall be refused to any vessel which shall have been ordered detained, which shall be in effect until it is shown that the vessel is not in violation of the applicable law and the regulations in this subchapter.

(1) Where a vessel is detained for noncompliance with "material alteration" and "effective maintenance" requirements of paragraph (f)(1) of this section, the detention shall only be exercised insofar as may be necessary to ensure that the vessel can proceed to sea without danger to passengers or crew.

(c) The detention of a vessel will be by written order of either the Coast Guard District Commander or the District Director of Customs, depending on who orders the detention. The Coast Guard District Commander will immediately arrange for a survey in the manner prescribed by section 7 of the load line acts. Unless the owner or agent waives in writing and stipulates to accept the Coast Guard's survey, the Coast Guard District Commander shall appoint three disinterested surveyors and, where practicable, one of them shall be from the Surveying Staff of the American Bureau of Shipping. Such surveyors shall conduct a survey to ascertain whether or not the vessel is loaded in violation of the applicable provisions in the load line acts, and the regulations in this subchapter. If the survey confirms the allegation that the vessel is in violation of either law or the applicable regulations in this subchapter, "the owner and agent shall bear the costs of the survey in addition to any penalty or fine imposed", as provided in these laws.

(d) Whenever a vessel is detained, the master or owner may, within 5 days, appeal to the Commandant who may, if he desires, order a further survey, and may affirm, set aside, or modify the order of the detaining officer.

(e) Where a foreign vessel is detained or intervention action of any other kind is taken against a foreign vessel, the officer carrying out the action shall immediately inform in writing the Consul or the diplomatic representative of the State whose flag the vessel is flying, of the decision involved together with all pertinent circumstances under which intervention was deemed necessary.

(f) Under sections 5 of the load line acts a vessel of a foreign country which has ratified the 1966 Convention, or which holds a recognized and valid 1930 Convention certificate, or which holds a valid Great Lakes Certificate, shall be exempt from the provisions of the regulations in this subchapter insofar as the marking of the load lines and the certificating thereof are concerned, so long as such country similarly recognizes the load lines established by this subchapter for the purpose of a voyage by sea subject to the proviso in paragraph (f)(1) of this section or the alternative proviso in paragraph (f)(2) of this section.

(1) If the foreign vessel is marked with load lines and has on board a valid International or Great Lakes Load Line Certificate certifying to the correctness of the marks, the control provisions in this part which are in accord with Article 21 of the 1966 Convention shall be observed. In this connection, the vessel shall not be loaded beyond the limits allowed by the certificate. The poistion of the load lines on the vessel shall correspond with the certificate. The vessel shall not have been so materially altered as to make the vessel manifestly unfit to proceed to sea without danger to human life, in regard to:

(i) The hull or superstructure (if necessitating assignment of an increased freeboard); and/or,

(ii) The appliances and fittings for protection of openings, guardrails, freeing ports, and means of access to crew's quarters (if necessitating replacement or other effective maintenance).

(2) (Alternatively provided) If the foreign vessel has on board an International Load Line Exemption Certificate in lieu of an International Load Line Certificate, 1966, in such case, verify that it is valid and any conditions stipulated therein are met.

(g) A foreign vessel of a nation for which the 1966 Convention has not come into force does not qualify for an International Load Line Certificate, 1966. In lieu thereof, such a vessel shall be required to have on board a valid Form *B* load line certificate or a recognized 1930 Convention certificate.

[CGFR 68-60, 33 FR 10055, July 12, 1968, as amended by CGFR 68-126, 34 FR 9012, June 5, 1969]

§ 42.07-75 Right of appeal.

(a) Whenever an owner, master, or agent of a vessel shall feel aggrieved by a decision or action of the American Bureau of Shipping, or a recognized classification society designated as a load line assigning authority, with respect to any matter arising in the performance of activities as an assigning authority, and after exhausting appeal reviews provided by the assigning authority such a person may appeal therefrom to the Commandant within 30 days after the decision or action appealed from shall have been rendered or taken. The decision of the Commandant on the matter shall be final.

(b) Any action or decision which is appealed shall remain in effect pending any decision by the authority to whom the appeal is directed.

[CGFR 68-60, 33 FR 10055, July 12, 1968]

Subpart 42.09—Load Line Assignments and Surveys—General Requirements

§ 42.09–1 Assignment of load lines.

(a) The assignment of load lines is conditioned upon the structural efficiency and satisfactory stability of the vessel, and upon the provisions provided on the vessel for her effective protection and that of the crew. Certain vessels, such as vessels carrying all their cargo as deck cargo, or vessels where design or service require special conditions to be applicable, shall have certain stability limitations imposed on them, as may be necessary. When stability limitations for a vessel are prescribed, the assigning authority shall furnish the master the vessel's maximum draft permitted and other conditions, including reference to Commandant approved operating stability features, which may be applicable.

(1) No load line assignment shall be made under this part to a vessel proceeding on a foreign voyage, or where the load line assignment is related to the flooded stability provisions and the vessel is proceeding on a domestic voyage, until the applicable light ship characteristics are established and incorporated into the vessel's stability data approved by the Commandant and furnished to the master of the vessel.

(2) If load line assignments are made to vessels for coastwise voyages before the results of the required stability characteristics are determined and incorporated into the vessel's stability data approved by the Commandant, then such load line assignments shall be regarded as conditional and shall be subject to verification or modification for removal of the conditional status. Any vessel with a conditional load line assignment shall not be loaded beyond a conservative safe draft. Where the Commandant deems it unnecessary, the requirement for furnishing stability information to the masters of coastwise vessels assigned load lines not related to flooded stability may be omitted and the assigning authority and others concerned will be so notified.

(b) Each vessel subject to load line requirements shall carry on board a valid certificate attesting to compliance with such requirements. (See §§ 42.07-35 and 42.07-40 for additional data furnished to the vessel.)

(c) The master of the vessel for which a load line certificate has been issued shall be responsible for the maintenance of such certificate on board such vessel and for compliance with its terms and conditions. Additionally, the master shall be responsible for having the current load line survey report on board the vessel. This report shall be made available to surveyors when carrying out subsequent load line surveys.

[CGFR 68-60, 33 FR 10055, July 12, 1968, as amended by CGFR 68-126, 34 FR 9012, June 5, 1969]

§ 42.09–5 All vessels—division into types.

(a) For the purpose of this Part, all vessels shall be considered as either Type "A" or Type "B" vessels.

(b) Type "A" vessels are normally designed to carry only liquid cargo in bulk, are arranged specifically for the purpose, and are assigned the least freeboards.

(c) All other vessels are considered to be Type "B" vessels, and are (except in special cases) assigned freeboards greater than those of Type "A" vessels, dependent upon the efficacy of the protection of openings, protection of crew, the degree of subdivision, etc., provided, as prescribed in this part.

(d) See Subparts 42.20 through 42.25 of this part for specific requirements governing freeboards for all vessels.

[CGFR 68-60, 33 FR 10056, July 12, 1968]

§ 42.09–10 Stability, subdivision, and strength.

(a) *All vessels.* Where regulations in this Part, or in Part 46 of this subchapter, require or permit load line assignment on the basis of the vessel's ability to meet specified flooding, including damage stability requirements, the owner shall furnish the necessary plans and calculations demonstrating that the vessel is in compliance with the applicable requirements. This material shall be furnished to the assigning authority for approval review at the earliest practicable date except where specifically required by Part 46 of this subchapter for passenger vessels to be submitted to the Commandant for approval.

(1) When stability information is required, the plans shall include the location and extent of all watertight subdivision bulkheads, etc., involved.

(2) Additional applicable stability, subdivision, and strength requirements are in §§ 42.09-1, 42.13-1 (a) and (b), 42.15-1 (a) and (b). The applicable flooded stability requirements are in §§ 42.20-5 and 42.20-10.

(b) *Passenger vessels.* In passenger vessels where the positions of the maximum load lines is subject to determination by the application of subdivision and stability requirements in this subchapter, the provisions of both Parts 42 and 46 shall be accounted for and developed as necessary. See Subchapter H (Passenger Vessels) of this chapter for related data required to be submitted to the Commandant.

(c) *Light ship data.* All plans, etc., necessary for obtaining the Commandant's approval of test results (light ship data) and stability information shall be furnished by the owner. In the absence of existing acceptable light ship stability information, such data shall be obtained from a stability test performed under the supervision of the Commandant. Results of such tests, if satisfactory, will be approved by the Commandant.

[CGFR 68-60, 33 FR 10056, July 12, 1968, as amended by CGFR 68-126, 34 FR 9012, June 5, 1969]

§ 42.09-15 Surveys by the American Bureau of Shipping or assigning authority.

(a) *General.* Before issuing a certificate or placement of load line marks on a vessel, the assigning and issuing authority shall make an initial or periodic survey of the vessel as required by this subchapter. A load line survey report shall be made, reflecting information and facts based on initial surveys, including required and special elements as may be deemed necessary by the assigning authority or the Commandant.

(b) *Initial survey.* An initial survey shall be made before the vessel is put in service or the first time the assigning authority is requested to survey a vessel. The survey shall include a complete examination of its structure and equipment insofar as required by the applicable requirements in this subchapter. This survey shall be such as to ensure that the arrangements, materials, scantlings, and subsequent placement of load line marks fully comply with applicable requirements.

(c) *Periodical survey.* A periodical survey shall be made at intervals not exceeding five (5) years from an initial or previous periodic survey. The survey shall be similar to the initial survey insofar as extent and purpose are concerned.

(1) If the load line marks are found to be correct for the condition the vessel is then in, the assigning and issuing authority shall issue a new load line certificate, valid for such time as the condition of the vessel then warrants but in no case for a period of longer than 5 years. If, after a survey has been passed, a loadline certificate can not be issued before the current certificate expires, the current certificate may be extended by an endorsement in accordance with the requirements contained in § 42.07-45(d). This endorsement of the assigning authority shall be placed on the back of the certificate, as shown on the forms in Subpart 42.50. However, if there have been alterations which affect the vessel's freeboards, such extension shall not be granted. This prohibition is the same as in Article 19(2) of the 1966 Convention.

(2) The periodical survey, including certificate extension or reissue, for a vessel holding an international load line exemption certificate for more than one voyage, shall be the same as for any other vessel covered by this section except for load line marks. However, other conditions specified in the exemption certificate shall be verified.

(d) *Annual surveys for endorsements.* Vessels subject to initial and periodic surveys shall have annual surveys, within 3 months either way of the certificate's anniversary date. The annual surveys shall be made by and prove satisfactory to the assigning and issuing authority prior to executing the required annual endorsements on load line certificates or exemption certificates. The scope shall be as defined in § 42.09–40 and such as to ensure that the applicable load line marks are found to be correct for the condition the vessel is then in.

[CGFR 68-60, 33 FR 10056, July 12, 1968, as amended by CGFR 68-126, 34 FR 9012, June 5, 1969; CGD 73-49R, 38 FR 12290, May 10, 1973]

§ 42.09–20 Surveys of foreign vessels.

(a) *General.* Foreign vessels of countries which have not ratified or acceded to the 1966 Convention, or which do not have valid certificates issued under other international convention or treaty and recognized by the United States of America, if desiring to depart from a port or place in the United States, the Commonwealth of Puerto Rico, the Territory of Guam, or other U.S. possessions, shall be subjected to survey, marking, and certification by a load line assigning and issuing authority as authorized under § 42.07–35 or § 42.07–40, unless:

(1) The vessel is exempted by the provisions of section 5 of the Act of March 2, 1929, as amended (46 U.S.C. 85d); or,

(2) The vessel is under tow and carrying neither passengers nor cargo.

(b) *Scope of survey.* A periodical survey described in § 42.09–15(c) shall be conducted by and prove satisfactory to the assigning and issuing authority. It shall be made prior to issue or reissue of the applicable certificate.

(c) *Certification of load lines.* The assigning and issuing authority after determining the vessel meets the applicable requirements in this Part may issue a load line certificate subject to requirements in § 42.07–45 and on the applicable form described in Subpart 42.50 of this Part: *Provided,* That the load line certificate issued shall be valid for a period of 1 year. The certificate may be revalidated by endorsement for additional 1 year periods if the condition of the vessel so warrants, but in any event the certificate shall become void five (5) years from date of issue, or at the expiration of the fourth (4th) yearly validation, whichever occurs first. Whenever the condition of the vessel warrants special limitations, such information and facts shall be attested to on the front or back of the certificate as necessary, by the assigning and issuing authority.

[CGFR 68-60, 33 FR 10056, July 12, 1968, as amended by CGFR 68-126, 34 FR 9013, June 5, 1969]

§ 42.09–25 Initial or periodic survey requirements for all vessels.

(a) Before a survey may be completed, the vessel shall be placed in a drydock or hauled out. The surveyor shall be given complete access to all parts of the vessel to ensure that the vessel complies with all applicable requirements.

(b) The surveyor shall examine on all vessels the items, etc., listed in this paragraph to determine if in satisfactory condition and meeting applicable requirements in this subchapter.

(1) Cargo hatch coamings, covers, beams and supports, gaskets, clamps, locking bars, tarpaulins, battens, cleats and wedges of hatches on exposed freeboard, quarter and superstructure decks, and elsewhere as may be necessary.

(2) Structure of the vessel, coamings, closures, and all means of protection provided for openings, such as for ventilators, companionways, machinery casings, fiddleys, funnels, enclosed superstructures on the freeboard deck (and their end bulkheads) or equivalent protective deck houses, openings in the freeboard and superstructure decks, and significant openings at higher levels in the vessel.

(3) Transverse watertight subdivision bulkheads, as fitted, including any openings therein and closures for such openings. They shall be examined throughout their vertical and transverse extent.

(4) All air-pipe outlets, their closures, all scuppers, and all sanitary discharges in the vessel's sides, including nonreturn valves installed.

(5) The main and auxiliary sea inlets and discharges in the machinery space, and elsewhere if existent, and the valves and controls for these items.

(6) All gangways, cargo ports, and airports, including dead covers or other similar openings in the vessel's sides and their closures.

(7) All guardrails, bulwarks, gangways, and freeing port shutters, including securing devices, and bars.

(8) All eye plates or similar fittings for timber (or other) deck-cargo lashings, including the lashings, sockets for uprights and protective devices as may be necessary for ventilators and steering arrangements.

[CGFR 68-60, 33 FR 10056, July 12, 1968, as amended by CGFR 68-126, 34 FR 9013, June 5, 1969]

§ 42.09-30 Additional survey requirements for steel-hull vessels.

(a) In addition to the requirements in § 42.09-25, the surveyor of the assigning authority shall examine the items, etc., listed in this section, to determine if in satisfactory condition and meeting applicable requirements in this subchapter.

(b) When the vessel is in drydock, the hull plating, etc., shall be examined.

(c) The holds, 'tween decks, peaks, bilges, machinery spaces, and bunkers shall be examined to determine the condition of the framing, etc.

(d) The deep tanks and other tanks which form part of the vessel shall be examined internally.

(e) If a double bottom is fitted, the tanks normally shall be examined internally. Where double bottom and other tanks are used for fuel-oil bunkers, such tanks need not be cleaned out, if the surveyor is able to determine by an external examination that their general condition is satisfactory.

(f) The deck shall be examined.

(g) Where, owing to the age and condition of the vessel or otherwise, the surveyor deems it necessary, the shell and deck plating may be required to be drilled or other acceptable means used, in order to ascertain the then thickness of such plating.

[CGFR 68-60, 33 FR 10057, July 12, 1968]

§ 42.09-35 Additional survey requirements for wood-hull vessels.

(a) In addition to the requirements in § 42.09-25, the surveyor of the assigning authority shall examine the items, etc., listed in this section, to determine if in satisfactory condition and meeting the applicable requirements in this subchapter.

(b) When the vessel is in drydock or hauled out, the keel, stem, stern frame or sternpost, outside planking, and caulking shall be examined.

(c) The fasteners shall be examined. Bolts, screws, or equivalent fastenings, as deemed necessary by the surveyor, must be backed out, or otherwise dealt with, to ensure soundness.

(d) The holds, 'tween decks, peaks, bilges, machinery spaces, and bunkers shall be examined.

(e) The entire structure, including decks, shall be examined. If considered necessary by the surveyor, borings shall be made, or other means may be used, to ascertain the condition of the materials. Should these measures disclose sufficient cause, further examination to satisfy the surveyor as to the true condition shall be made and check locations listed. This list shall be submitted to the assigning and issuing authority for record purposes, and for use in subsequent surveys.

[CGFR 68-60, 33 FR 10057, July 12, 1968]

§ 42.09-40 Annual surveys.

(a) Relative to §§ 42.09-15(d) and 42.09-20(c), the assigning and issuing authority shall make an annual survey of each vessel holding an appropriate certificate issued under this subchapter.

(b) The annual survey shall be of such scope and extent so as to ensure:

(1) The maintenance in an effective condition of the fittings and appliances for the:

(i) Protection of openings;

(ii) Guardrails;

(iii) Freeing ports; and,

(iv) Means of access to crew's quarters.

(2) That there have not been alterations made to the hull or superstructure which would affect the calculations determining the position of the load line marks.

(c) The assigning and issuing authority shall report on the annual survey made to the owner of the vessel.

(d) The scale of fees payable to the assigning and issuing authority for services is set forth in Subpart 42.35.

[CGFR 68-60, 33 FR 10057, July 12, 1968]

§ 42.09-45 Correction of deficiencies.

(a) During and after any survey made by the assigning and issuing authority, those items, fittings, etc., which are found to be in an unsatisfactory condition by the surveyor shall be repaired or renewed in order to place the vessel in a satisfactory condition.

(b) No load line certificate shall be issued, endorsed, extended, or reissued or delivered to a vessel subject to this subchapter until after unsatisfactory conditions have been corrected as required by paragraph (a) of this section.

[CGFR 68-60, 33 FR 10057, July 12, 1968, as amended by CGFR 68-126, 34 FR 9013, June 5, 1969]

§ 42.09-50 Repairs or alterations to vessel after it has been surveyed.

(a) After any survey of the vessel made under §§ 42.09-25 to 42.09-40, inclusive, as applicable, has been completed and deficiencies corrected as provided in § 42.09-45, no change shall be made in the vessel's structure, equipment, arrangement, material, or scantlings as covered by such survey, without the prior specific approval of the assigning and issuing authority.

(b) To avoid a freeboard or other penalty, any vessel which undergoes repairs, alterations, or modifications, including outfitting related thereto, shall continue to comply with the applicable requirements consistent with the load line certificate held.

(c) An existing vessel, originally certificated under Part 43 of this subchapter, which undergoes repairs, alterations, or modifications of a major character, shall meet the requirements for a new vessel in this part insofar as the assigning and issuing authority and the Commandant deem reasonable and practicable.

[CGFR 68-60, 33 FR 10057, July 12, 1968, as amended by CGFR 68-126, 34 FR 9013, June 5, 1969]

Subpart 42.11—Applications for Load Line Assignments, Surveys, and Certificates

§ 42.11-1 General.

(a) As described in this subchapter under §§ 42.07-35, 42.07-40, 42.09-15, and 42.09-20, the American Bureau of Shipping or other recognized classification societies approved as load line assigning and issuing authorities perform the duties connected with making load line assignments to vessels.

(b) The Commandant is responsible for the administration of the load line acts, the 1930 and 1966 Conventions, other treaties regarding load lines, and the implementing regulations in this subchapter which include prescribed form and content of applicable load line certificates.

(c) Except in special instances for Coast Guard vessels, the Commandant does not perform the duties of a load line assigning authority.

[CGFR 68-60, 33 FR 10057, July 12, 1968, as amended by CGFR 68-126, 34 FR 9013, June 5, 1969]

§ 42.11-5 Applications for load line assignments, surveys, and certificates for U.S.-flag vessels.

(a) Normally, the owner, master, or agent of a vessel shall apply in writing, on a timely basis, to the American Bureau of Shipping for the assignment, survey, and certification of load lines. When nonconcurrent, a separate application shall be made for each function desired and submitted on a timely basis. The mailing address of the home office of American Bureau of Shipping is 45 Broad Street, New York, N.Y. 10004.

(b) After the Commandant has approved a recognized classification society as a load line assigning and issuing authority for a vessel, as described in a written request of the shipowner, the owner shall apply in writing, on a timely basis, direct to the approved assigning and issuing authority for the assignment, survey, and certification of load lines. When nonconcurrent, a separate application shall be made to such authority for each function desired, and submitted on a timely basis.

[CGFR 68-60, 33 FR 10057, July 12, 1968, as amended by CGFR 68-126, 34 FR 9013, June 5, 1969]

§ 42.11-10 Applications for load line assignments and certificates for vessels other than U.S.-flag vessels.

(a) The application for the assignment of load lines and certificate for a foreign vessel belonging to (or which will belong to) either a country ratifying or acceding to the International Convention on Load Lines, 1966, or to a country with which the United States of America has a reciprocal load line agreement in effect shall be made by the Government whose flag the vessel flies, or will fly. The application may be made direct to the American Bureau of Shipping, or after receiving the Commandant's approval, to a recognized classification society which that country has requested as an assigning and issuing authority. When the load line assignment and certificate are authorized pursuant to the requirements in this Part, the certificate must contain a statement that it has been issued at the request of a specific Government, which shall be named therein.

(1) When the load line assignment is performed under the applicable regulations in this subchapter, the assigning and issuing authority shall transmit to the requesting Government at the earliest practicable date, one copy of each certificate issued, the load line survey report used for computing the freeboard, and the freeboard computations. For information, the assigning and issuing authority shall also notify the Commandant of the names of the vessel and the Government involved and the date and place where the work was done.

(b) For a foreign vessel of a country not included in paragraph (a) of this section, the owner, master, or agent normally shall apply in writing to the American Bureau of Shipping, or to any other recognized assigning and issuing authority after it has been approved by the Commandant, for the assignment, survey, and certification of load lines, or for reissue of a load line certificate, as may be necessary for the vessel to clear ports of the United States, the Commonwealth of Puerto Rico, the Territory of Guam, or other U.S. possessions. Normally the same requirements, conditions, procedures, distribution of applicable certificates, etc., shall be applied to such foreign vessels which are applied to similar U.S.-flag vessels of 150 gross tons or over.

[CGFR 68-60, 33 FR 10058, July 12, 1968, as amended by CGFR 68-126, 34 FR 9013, June 5, 1969]

§ 42.11-15 Application for timber load lines.

(a) The owner, master, or agent of a vessel having load lines assigned under this subchapter may apply to the assigning and issuing authority for timber load lines when making his application for a load line certificate, After the vessel has been found in compliance with the applicable requirements in this subchapter, it may be marked with timber load lines, which will also be certified to in the load line certificate.

[CGFR 68-60, 33 FR 10058, July 12, 1968, as amended by CGFR 68-126, 34 FR 9013, June 5, 1969]

§ 42.11-20 Application for annual survey.

(a) The owner, master, or agent of a vessel holding a load line certificate shall apply to the assigning and issuing authority who issued the certificate for the annual survey required by § 42.09-40 or the International Convention on Load Lines, 1966.

[CGFR 68-60, 33 FR 10058, July 12, 1968]

Subpart 42.13—General Rules for Determining Load Lines

§ 42.13-1 Assumptions.

(a) The regulations in this Part are based on the assumption that the nature and stowage of the cargo, ballast, etc., are such as will secure sufficient stability of the vessel and avoid excessive structural stress.

(b) The regulations in this Part are also based on the assumption that, where there are other international requirements relating to stability or subdivision applicable to vessels, these requirements have been met.

[CGFR 68-60, 33 FR 10058, July 12, 1968]

§ 42.13-5 Strength of vessel.

(a) The assigning and issuing authority shall satisfy itself that the general structural strength of the vessel is sufficient for the draft corresponding to the freeboard assigned, and when requested shall furnish pertinent strength information to the Commandant.

(b) Vessels built and maintained in conformity with the requirements of a classification society recognized by the Commandant are considered to possess adequate strength for the purpose of the applicable requirements in this subchapter unless deemed otherwise by the Commandant.

[CGFR 68-60, 33 FR 10058, July 12, 1968, as amended by CGFR 68-126, 34 FR 9013, June 5, 1969]

§ 42.13-10 Freeboards assigned vessels.

(a) Vessels with mechanical means of propulsion, or lighters, barges, or other vessels without independent means of propulsion, shall be assigned freeboards in accordance with the provisions of §§ 42.13-1 to 42.20-75, inclusive.

(b) Vessels carrying timber deck cargoes may be assigned, in addition to the freeboards required by paragraph (a) of this section, timber freeboards in accordance with the provisions of §§ 42.25-1 to 42.25-20, inclusive.

(c) Vessels designed to carry sail, whether as the sole means of propulsion or as a supplementary means, and tugs, shall be assigned freeboards in accordance with the provisions of §§ 42.13-1 to 42.20-75, inclusive, and such additional freeboards as determined necessary by the Commandant under the procedure of paragraph (f) of this section.

(d) Vessels of wood or of composite construction, or of other materials the use of which the Commandant has approved, or vessels whose constructional features are such as to render the application of the provisions of §§ 42.13-1 to 42.25-20 unreasonable or impracticable, shall be assigned freeboards as determined necessary by the Commandant under the procedure of paragraph (f) of this section.

(e) The requirements in §§ 42.15-1 to 42.15-80, inclusive, shall apply to every vessel to which a minimum freeboard is assigned. Relaxations from these requirements may be granted to a vessel to which a greater than minimum freeboard is assigned provided the safety conditions of the vessel are determined to be satisfactory under paragraph (f) of this section.

(f) In each case specified by paragraphs (c) to (e) inclusive of this section, the assigning authority shall report to the Commandant the specific matters in which the vessel is deficient or requires special freeboard consideration due to design, arrangement, construction materials, propulsive method, or relaxation of requirements in this part. The report shall also furnish background data and recommendations of the assigning authority (including freeboard additions), as will enable the Commandant to reach a decision.

[CGFR 68-60, 33 FR 10058, July 12, 1968, as amended by CGFR 68-126, 34 FR 9013, June 5, 1969]

§ 42.13-15 Definitions of terms.

(a) *Length.* The length (*L*) shall be taken as 96 percent of the total length on a waterline at 85 percent of the least molded depth measured from the top of the keel, or as the length from the foreside of the stem to the axis of the rudder stock on that waterline, if that be greater. In vessels designed with a rake of keel the waterline on which this length is measured shall be parallel to the designed waterline.

(b) *Perpendiculars.* The forward and after perpendiculars shall be taken at the forward and after ends of the length (*L*). The forward perpendicular shall coincide with the foreside of the stem on the waterline on which the length is measured.

(c) *Amidships.* Amidships is at the middle of the length (*L*).

(d) *Breadth.* Unless expressly provided otherwise, the breadth (*B*) is the maximum breadth of the vessel, measured amidships to the molded line of the frame in a vessel with a metal shell and to the outer surface of the hull in a vessel with a shell of any other material.

(e) *Molded depth.* (1) The molded depth is the vertical distance measured from the top of the keel to the top of the freeboard deck beam at side. In wood and composite vessels the distance is measured from the lower edge of the keel rabbet. Where the form at the lower part of the midship section is of a hollow character, or where thick garboards are fitted, the distance is measured from the point where the line of the flat of the bottom continued inwards cuts the side of the keel.

(2) In vessels having rounded gunwales, the molded depth shall be measured to the point of intersection of the molded lines of the deck and sides, the lines extending as though the gunwale were of angular design.

(3) Where the freeboard deck is stepped and the raised part of the deck extends over the point at which the molded depth is to be determined, the molded depth shall be measured to a line of reference extending from the lower part of the deck along a line parallel with the raised part.

(f) *Depth for freeboard* (*D*). (1) The depth for freeboard (*D*) is the molded depth amidships, plus the thickness of the freeboard deck stringer plate, where fitted, plus

$$T(L-S)/L$$

if the exposed freeboard deck is sheathed;

where:

T is the mean thickness of the exposed sheathing clear of deck openings; and
S is the total length of superstructures as defined in paragraph (j)(4) of this section.

(2) The depth for freeboard (*D*) in a vessel having a rounded gunwale with a radius greater than 4 percent of the breadth (*B*) or having topsides of unusual form is the depth for freeboard of a vessel having a midship section with vertical topsides and with the same round of beam and area of topside section equal to that provided by the actual midship section.

(g) *Block coefficient.* The block coefficient (C_b) is given by

$$C_b = \Delta / L.B.d_1$$

where Δ is the volume of the molded displacement of the vessel, excluding bossing, in a vessel with a metal shell, and is the volume of displacement to the outer surface of the hull in a vessel with a shell of any other material, both taken at a molded draft of d_1; and, d_1 is 85 percent of the least molded depth.

(h) *Freeboard.* The freeboard assigned is the distance measured vertically downward amidships from the upper edge of the deck line to the upper edge of the related load line.

(i) *Freeboard deck.* (1) The freeboard deck is normally the uppermost complete deck exposed to weather and sea, which has permanent means of closing all openings in the weather part thereof, and below which all openings in the sides of the vessel are fitted with permanent means of watertight closing. In a vessel having a discontinuance freeboard deck, the lowest line of the exposed deck and the continuation of that line parallel to the upper part of the deck is taken as the freeboard deck. At the option of the owner and subject to the approval of the assigning authority a lower deck may be designated as the freeboard deck, provided it is a complete and permanent deck continuous in a fore and aft direction at least between the machinery space and peak bulkheads and continuous athwartships. When this lower deck is stepped the lowest line of the deck and the continuation of that line parallel to the upper part of the deck is taken as the freeboard deck.

(2) When a lower deck is designated as the freeboard deck, that part of the hull which extends above the freeboard deck is treated as a superstructure so far as concerns the application of the conditions of assignment and the calculation of freeboard. It is from this deck that the freeboard is calculated.

(j) *Superstructure.* (1) A superstructure is a decked structure on the freeboard deck, extending from side to side of the vessel or with the side plating not being inboard of the shell plating more than 4 percent to the breadth. (*B*). A raised quarter deck is regarded as a superstructure.

(2) An enclosed superstructure is a superstructure with:

(i) Enclosing bulkheads of efficient construction;

(ii) Access openings, if any in these bulkheads fitted with doors complying with the requirements of § 42.15-10; and,

(iii) All other openings in sides or ends of the superstructure fitted with efficient weathertight means of closing.

NOTE: A bridge or poop shall not be regarded as enclosed unless access is provided for the crew to reach machinery and other working spaces inside the superstructures by alternative means, which are available at all times when bulkhead openings are closed.

(3) The height of a superstructure is the least vertical height measured at side from the top of the superstructure deck beams to the top of the freeboard deck beams.

(4) The length of a superstructure (*S*) is the mean length of the part of the superstructure which lies within the length (*L*).

(k) *Flush deck vessel.* A flush deck vessel is one which has no superstructure on the freeboard deck.

(l) *Weathertight.* Weathertight means that in any sea conditions water will not penetrate into the vessel.

[CGFR 68-60, 33 FR 10058, July 12, 1968, as amended by CGFR 68-126, 34 FR 9013, June 5, 1969]

§ 42.13-20 Deck line.

(a) The deck line is a horizontal line 12 inches in length and 1 inch in breadth. It shall be marked amidships on each side of the vessel, and its upper edge shall normally pass through the point where the continuation outwards of the upper surface of the freeboard deck intersects the outer surface of the shell (as illustrated in Figure 42.13-20(a)), provided that the deck line may be placed with reference to another fixed point on the vessel on condition that the freeboard is correspondingly corrected. The location of the reference point and the identification of the freeboard deck shall in all cases be indicated on the International Load Line Certificate (1966), and, as applicable, on all other load line certificates issued pursuant to this Part 42.

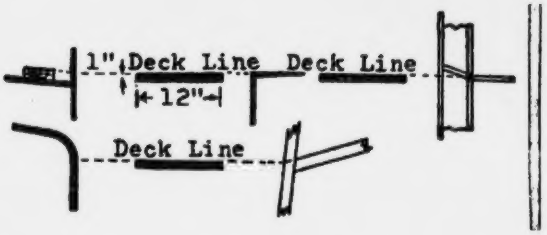


FIGURE 42.13-20(a)—Deck line.

[CGFR 68-60, 33 FR 10059, July 12, 1968, as amended by CGFR 68-126, 34 FR 9014, June 5, 1969]

§ 42.13-25 Load line mark.

(a) The load line mark shall consist of a ring 12 inches in outside diameter and 1 inch wide which is intersected by a horizontal line 18 inches in length and 1 inch in breadth, the upper edge of which passes through the center of the ring. The center of the ring shall be placed amidships and at a distance equal to the assigned summer freeboard measured vertically below the upper edge of the deck line (as illustrated in Figure 42.13-25(a)).

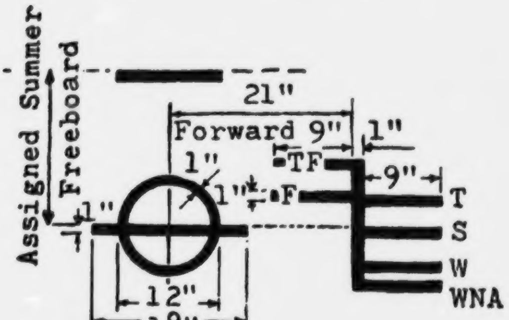


FIGURE 42.13-25(a)—Load line mark and lines to be used with this mark.

[CGFR 68-60, 33 FR 10059, July 12, 1968]

§ 42.13-30 Lines to be used with the load line mark.

(a) The lines which indicate the load line assigned in accordance with the regulations in this Part shall be horizontal lines 9 inches in length and 1 inch in breadth which extend forward of, unless expressly provided otherwise, and at right angles to, a vertical line 1 inch in breadth marked at a distance 21 inches forward of the center of the ring (as illustrated in Figure 42.13-25(a)).

(b) The following load lines shall be used:

(1) The summer load line indicated by the upper edge of the line which passes through the center of the ring and also by a line marked *S*.

(2) The winter load line indicated by the upper edge of a line marked *W*.

(3) The winter North Atlantic load line indicated by the upper edge of a line marked *WNA*.

(4) The tropical load line indicated by the upper edge of a line marked *T*.

(5) The fresh water load line in summer indicated by the upper edge of a line marked *F*. The fresh water load line in summer is marked abaft the vertical line. The difference between the fresh water load line in summer and the summer load line is the allowance to be made for loading in fresh water at the other load lines.

(6) The tropical fresh water load line indicated by the upper edge of a line marked *TF*, and marked abaft the vertical line.

(c) If timber freeboards are assigned, the timber load lines shall be marked in addition to ordinary load lines. These lines shall be horizontal lines 9 inches in length and 1 inch in breadth which extend abaft unless expressly provided otherwise, and are at right angles to, a vertical line 1 inch in breadth marked at a distance 21 inches abaft the center of the ring (as illustrated in Figure 42.13-30(c)).

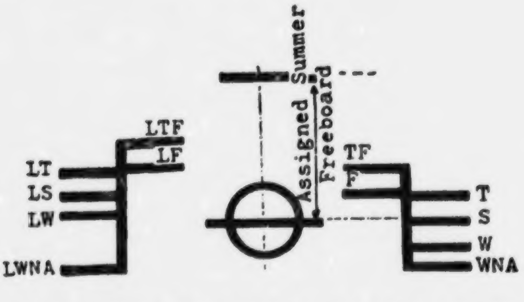


FIGURE 42.13-30(c)—Timber load line mark and lines to be used with this mark.

(d) The following timber load lines shall be used:

(1) The summer timber load line indicated by the upper edge of a line marked *LS*.

(2) The winter timber load line indicated by the upper edge of a line marked *LW*.

(3) The winter North Atlantic timber load line indicated by the upper edge of a line marked *LWNA*.

(4) The tropical timber load line indicated by the upper edge of a line marked *LT*.

(5) The fresh water timber load line in summer indicated by the upper edge of a line marked *LF* and marked forward of the vertical line.

NOTE: The difference between the fresh water timber load line in summer and the summer timber load line is the allowance to be made for loading in fresh water at the other timber load lines.

(6) The tropical fresh water timber load line indicated by the upper edge of a line marked *LTF* and marked forward of the vertical line.

(e) Where the characteristics of a vessel, or the nature of the vessel's service or navigational limits make any of the seasonal lines inapplicable, these lines may be omitted.

(f) Where a vessel is assigned a greater than minimum freeboard so that the load line is marked at a position corresponding to, or lower than, the lowest seasonal load line assigned at minimum freeboard in accordance with the present Convention, only the fresh water load line need be marked.

(g) On sailing vessels only the fresh water load line and the winter North Atlantic load line need be marked (as illustrated in Figure 42.13-30(g)).

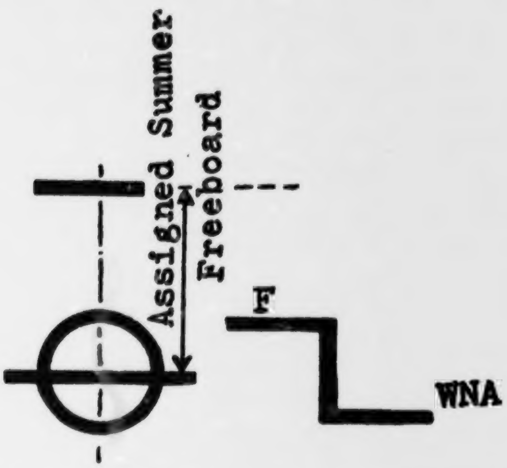


FIGURE 42.13-30(g)—Load line mark on sailing vessel and lines to be used with this mark.

(h) Where a winter North Atlantic load line is identical with the winter load line corresponding to the same vertical line, this load line shall be marked *W.*

(i) Additional load lines required by other international conventions in force may be marked at right angles to and abaft the vertical line specified in paragraph (a) of this section.

[CGFR 68-60, 33 FR 10059, July 12, 1968, as amended by CGFR 68-126, 34 FR 9014, June 5, 1969]

§ 42.13-35 Mark of assigning authority.

(a) The mark of the assigning authority by whom the load lines are assigned may be indicated alongside the load line ring above the horizontal line which passes through the center of the ring, or above and below it. This mark shall consist of not more than four initials to identify the assigning authority's name, each measuring approximately 4½ inches in height and 3 inches in width.

[CGFR 68-60, 33 FR 10060, July 12, 1968]

§ 42.13-40 Details of marking.

(a) The ring, lines and letters shall be painted in white or yellow on a dark ground or in black on a light ground. They shall also be permanently marked on the sides of the vessels to the satisfaction of the assigning authority. The marks shall be plainly visible and, if necessary, special arrangements shall be made for this purpose.

[CGFR 68-60, 33 FR 10060, July 12, 1968, as amended by CGFR 68-126, 34 FR 9014, June 5, 1969]

§ 42.13-45 Verification of marks.

(a) The International Load Line Certificate (1966) shall not be delivered to the vessel until § 42.07-5 has been fully complied with under the authority and provisions of Subparts 42.07 and 42.09 of this Part.

[CGFR 68-60, 33 FR 10060, July 12, 1968, as amended by CGFR 68-126, 34 FR 9014, June 5, 1969]

Subpart 42.15—Conditions of Assignment of Freeboard

§ 42.15-1 Information to be supplied to the master.

(a) The master of every new vessel shall be supplied with sufficient information in a form approved by the assigning and issuing authority, to enable him to arrange for the loading and ballasting of his vessel in such a way as to avoid the creation of any unacceptable stresses in the vessel's structure: *Provided,* That this requirement need not apply to any particular length, design or class of vessel where the Commandant considers it to be unnecessary and so notifies the assigning and issuing authority.

(b) The master of every new vessel, which is not already provided with stability information under an international convention for the safety of life at sea in force, shall be supplied with sufficient information in a form approved by the Commandant, to give him guidance as to the stability of the vessel under varying conditions of service, and a copy shall be furnished to the Commandant.

[CGFR 68-60, 33 FR 10060, July 12, 1968, as amended by CGFR 68-126, 34 FR 9014, June 5, 1969]

§ 42.15-5 Superstructure end bulkheads.

(a) Bulkheads at exposed ends of enclosed superstructures shall be of efficient construction and shall be to the satisfaction of the assigning authority.

[CGFR 68-60, 33 FR 10060, July 12, 1968, as amended by CGFR 68-126, 34 FR 9014, June 5, 1969]

§ 42.15-10 Doors.

(a) All access openings in bulkheads at ends of enclosed superstructures shall be fitted with doors of steel or other equivalent material, permanently and strongly attached to the bulkhead, and framed, stiffened and fitted so that the whole structure is of equivalent strength to the unpierced bulkhead and weathertight when closed. The means for securing these doors weathertight shall consist of gaskets and clamping devices or other equivalent means and shall be permanently attached to the bulkhead or to the doors themselves, and the doors shall be so arranged that they can be operated from both sides of the bulkhead.

(b) Except as otherwise provided in these regulations, the height of the sills of access openings in bulkheads at ends of enclosed superstructures shall be at least 15 inches above the deck.

[CGFR 68-60, 33 FR 10060, July 12, 1968]

§ 42.15-15 Position of hatchways, doorways and ventilators.

(a) For the purpose of this part two positions of hatchways, doorways and ventilators are defined as follows:

(1) Position 1: Upon exposed freeboard and raised quarter decks, and upon exposed superstructure decks situated forward of a point located a quarter of the vessel's length from the forward perpendicular.

(2) Position 2: Upon exposed superstructure decks situated abaft a quarter of the vessel's length from the forward perpendicular.

[CGFR 68-60, 33 FR 10060, July 12, 1968, as amended by CGFR 68-126, 34 FR 9014, June 5, 1969]

§ 42.15-20 Cargo and other hatchways.

(a) The construction and the means for securing the weathertightness of cargo and other hatchways in positions 1 and 2 shall be at least equivalent to the requirements of §§ 42.15-25 and 42.15-30.

(b) Coamings and hatchway covers to exposed hatchways on decks above the superstructure deck shall comply with the requirements of the assigning authority.

[CGFR 68-60, 33 FR 10060, July 12, 1968, as amended by CGFR 68-126, 34 FR 9014, June 5, 1969]

§ 42.15-25 Hatchways closed by portable covers and secured weathertight by tarpaulins and battening devices.

(a) *Hatchway coamings.* (1) The coamings of hatchways closed by portable covers secured weathertight by tarpaulins and battening devices shall be of substantial construction, and their height above the deck shall be at least as follows:

(i) 23½ inches if in position 1.

(ii) 17½ inches if in position 2.

(b) *Hatchway covers.* (1) The width of each bearing surface for hatchway covers shall be at least 2½ inches.

(2) Where covers are made of wood, the finished thickness shall be at least 2⅜ inches in association with a span of not more than 4.9 feet.

(3) Where covers are made of mild steel, the strength shall be calculated with assumed loads not less than 358 pounds per square foot on hatchways in position 1, and not less than 266 pounds per square foot on hatchways in position 2, and the product of the maximum stress thus calculated and the factor 4.25 shall not exceed the minimum ultimate strength of the material. They shall be so designed as to limit the deflection to not more than 0.0028 times the span under these loads.

(4) The assumed loads on hatchways in position 1 may be reduced to 205 pounds per square foot for vessels of 79 feet in length and shall be not less than 358 pounds per square foot for vessels of 328 feet in length. The corresponding loads on hatchways in position 2 may be reduced to 154 pounds per square foot and 266 pounds per square foot respectively. In all cases values at intermediate lengths shall be obtained by linear interpolation.

(c) *Portable beams.* (1) Where portable beams for supporting hatchway covers are made of mild steel the strength shall be calculated with assumed loads not less than 358 pounds per square foot on hatchways in position 1 and not less than 266 pounds per square foot on hatchways in position 2 and the product of the maximum stress thus calculated and the factor 5 shall not exceed the minimum ultimate strength of the material. They shall be so designed as to limit the deflection to not more than 0.0022 times the span under these loads. For vessels of not more than 328 feet in length the requirements of paragraph (b)(4) of this section are applicable.

(d) *Pontoon covers.* (1) Where pontoon covers used in place of portable beams and covers are made of mild steel the strength shall be calculated with the assumed loads given in paragraph (b)(3) of this section, and the product of the maximum stress thus calculated and the factor 5 shall not exceed the minimum ultimate strength of the material. They shall be so designed as to limit the deflection to not more than 0.0022 times the span. Mild steel plating forming the tops of covers shall be not less in thickness than 1 percent of the spacing of stiffeners or 0.24 inches if that be greater. For vessels of not more than 328 feet in length the requirements of paragraph (b)(4) of this section are applicable.

(2) The strength and stiffness of covers made of materials other than mild steel shall be equivalent to those of mild steel to the satisfaction of the assigning authority.

(e) *Carriers or sockets.* (1) Carriers or sockets for portable beams shall be of substantial construction, and shall provide means for the efficient fitting and securing of the beams. Where rolling types of beams are use, the arrangements shall ensure that the beams remain properly in position when the hatchway is closed.

(f) *Cleats.* (1) Cleats shall be set to fit the taper of the wedges. They shall be at least 2½ inches wide and spaced not more than 23½ inches center to center; the cleats along each side or end shall be not more than 6 inches from the hatch corners.

(g) *Battens and wedges.* (1) Battens and wedges shall be efficient and in good condition. Wedges shall be of tough wood or other equivalent material. They shall have a taper of not more than 1 in 6 and shall be not less than ½-inch thick at the toes.

(h) *Tarpaulins.* (1) At least two layers of tarpaulin in good condition shall be provided for each hatchway in positions 1 and 2.

(2) The tarpaulins shall be waterproof and of ample strength. They shall be of a material of at least a standard weight and quality as approved by the assigning and issuing authority.

(i) *Security of hatchway covers.* (1) For all hatchways in position 1 or 2, steel bars or other equivalent means shall be provided in order efficiently and independently to secure each section of hatchway covers after the tarpaulins are battened down. Hatchway covers of more than 4.9 feet in length shall be secured by at least two such securing appliances.

[CGFR 68-60, 33 FR 10060, July 12, 1968, as amended by CGFR 68-126, 34 FR 9014, June 5, 1969]

§ 42.15-30 Hatchways closed by weathertight covers of steel or other equivalent material fitted with gaskets and clamping devices.

(a) *Hatchway coamings.* At positions 1 and 2 the height above the deck of hatchway coamings fitted with weathertight hatch covers of steel or other equivalent material fitted with gaskets and clamping devices shall be as specified in § 42.15-25(a)(1). The height of these coamings may be reduced, or the coamings omitted entirely, on condition that the assigning authority is satisfied that the safety of the vessel is not thereby impaired in any sea conditions. Where coamings are provided they shall be of substantial construction.

(b) *Weathertight covers.* (1) Where weathertight covers are of mild steel the strength shall be calculated with assumed loads not less than 358 pounds per square foot on hatchways in position 1, and not less than 255 pounds per square foot on hatchways in position 2, and the product of the maximum stress thus calculated and the factor of 4.25 shall not exceed the minimum ultimate strength of the material. They shall be so designed as to limit the deflection to not more than 0.0028 times the span under these loads. Mild steel plating forming the tops of covers shall be not less in thickness than one percent of the spacing of stiffeners or 0.24 inches if that be greater. The provisions of § 42.15-25(b)(4) are applicable for vessels of not more than 328 feet in length.

(2) The strength and stiffness of covers made of materials other than mild steel shall be equivalent to those of mild steel to the satisfaction of the assigning authority.

(c) *Means for securing weathertightness.* (1) The means for securing and maintaining weathertightness shall be to the satisfaction of the assigning authority.

(2) The arrangements shall ensure that the tightness can be maintained in any sea conditions. For this purpose tests for tightness shall be required at the initial surveys, and may be required at periodical surveys and at annual surveys or at more frequent intervals.

[CGFR 68-60, 33 FR 10061, July 12, 1968, as amended by CGFR 68-126, 34 FR 9014, June 5, 1969]

§ 42.15-35 Machinery space openings.

(a) Machinery space openings in position 1 or 2 shall be properly framed and efficiently enclosed by steel casings of ample strength, and where the casings are not protected by other structures their strength shall be specifically considered. Access openings in such casings shall be fitted with doors complying with the requirements of § 42.15-10(a), the sills of which shall be at least 23½ inches above the deck if in position 1, and at least 15 inches above the deck if in position 2. Other openings in such casings shall be fitted with equivalent covers, permanently attached in their proper positions.

(b) Coamings of any fiddley, funnel, or machinery space ventilators in an exposed position on the freeboard or superstructure deck shall be as high above the deck as is reasonable and practicable. Fiddley openings shall be fitted with strong covers of steel or other equivalent material permanently attached in their proper positions and capable of being secured weathertight.

[CGFR 68-60, 33 FR 10061, July 12, 1968]

§ 42.15-40 Miscellaneous openings in freeboard and superstructure decks.

(a) Manholes and flush scuttles in position 1 or 2 or within superstructures other than enclosed superstructures shall be closed by substantial covers capable of being made watertight. Unless secured by closely spaced bolts, the covers shall be permanently attached.

(b) Openings in freeboard decks other than hatchways, machinery space openings, manholes, and flush scuttles shall be protected by an enclosed superstructure, or by a deckhouse or companionway of equivalent strength and weathertightness. Any such opening in an exposed superstructure deck or in the top of a deckhouse on the freeboard deck which gives access to a space below the freeboard deck or a space within an enclosed superstructure shall be protected by an efficient deckhouse or companionway. Doorways in such deckhouses or companionways shall be fitted with doors complying with the requirements of § 42.15-10(a).

(c) In position 1 the height above the deck of sills to the doorways in companionways shall be at least 23½ inches. In position 2 they shall be at least 15 inches.

[CGFR 68-60, 33 FR 10061, July 12, 1968, as amended by CGFR 68-126, 34 FR 9014, June 5, 1969]

§ 42.15-45 Ventilators.

(a) Ventilators in position 1 or 2 to spaces below the freeboard decks or decks of enclosed superstructures shall have coamings of steel or other equivalent material, substantially constructed and efficiently connected to the deck. Where the coaming of any ventilator exceeds 35½ inches in height it shall be specially supported.

(b) Ventilators passing through superstructures other than enclosed superstructures shall have substantially constructed coamings of steel or other equivalent material at the freeboard deck.

(c) Ventilators in position 1 the coamings of which extend to more than 14.8 feet above the deck, and in position 2 the coamings of which extend to more than 7.5 feet above the deck, need not be fitted with closing arrangements unless specifically required by the assigning authority.

(d) Except as provided in paragraph (c) of this section ventilator openings shall be provided with efficient weathertight closing appliances. In vessels of not more than 328 feet in length the closing appliances shall be permanently attached; where not so provided in other vessels, they shall be conveniently stowed near the ventilators to which they are to be fitted. Ventilators in position 1 shall have coamings of a height of at least 35½ inches above the deck; in position 2 the coamings shall be of a height at least 30 inches above the deck.

(e) In exposed positions, the height of coamings may be required to be increased to the satisfaction of the assigning authority.

[CGFR 68-60, 33 FR 10061, July 12, 1968, as amended by CGFR 68-126, 34 FR 9014, June 5, 1969]

§ 42.15–50 Air pipes.

(a) Where air pipes to ballast and other tanks extend above the freeboard or superstructure decks, the exposed parts of the pipes shall be of substantial construction; the height from the deck to the point where water may have access below shall be at least 30 inches on the freeboard deck and 17½ inches on the superstructure deck. Where these heights may interfere with the working of the vessel, a lower height may be approved, provided the assigning authority is satisfied that the closing arrangements and other circumstances justify a lower height. Satisfactory means permanently attached, shall be provided for closing the openings of the air pipes.

[CGFR 68-60, 33 FR 10062, July 12, 1968, as amended by CGFR 68-126, 34 FR 9014, June 5, 1969]

§ 42.15–55 Cargo ports and other similar openings.

(a) Cargo ports and other similar openings in the sides of vessels below the freeboard deck shall be fitted with doors so designed as to ensure watertightness and structural integrity commensurate with the surrounding shell plating, to the satisfaction of the assigning authority. The arrangements shall be subject to tightness tests at the initial survey and at such subsequent surveys or more frequent intervals as deemed necessary. The number of such openings shall be the minimum compatible with the design and proper working of the vessel.

(b) Unless permitted by the Commandant the lower edge of such openings shall not be below a line drawn parallel to the freeboard deck at side, which has at its lowest point the upper edge of the uppermost load line.

[CGFR 68-60, 33 FR 10062, July 12, 1968, as amended by CGFR 68-126, 34 FR 9014, June 5, 1969]

§ 42.15–60 Scuppers, inlets, and discharges.

(a) Discharges led through the shell either from spaces below the freeboard deck or from within superstructures and deckhouses on the freeboard deck fitted with doors complying with the requirements of § 42.15-10 shall be fitted with efficient and accessible means for preventing water from passing inboard. Normally, each separate discharge shall have one automatic nonreturn valve with a positive means of closing it from a position above the freeboard deck. Where, however, the vertical distance from the summer load waterline to the inboard end of the discharge pipe exceeds $0.01L$, the discharge may have two automatic nonreturn valves without positive means of closing: *Provided,* That the inboard valve is always accessible for examination under service conditions; where that vertical distance exceeds $0.02L$ a single automatic nonreturn valve without positive means of closing may be accepted subject to the approval of the assigning authority. The means for operating the positive action valve shall be readily accessible and provided with an indicator showing whether the valve is open or closed.

(b) In manned machinery spaces main and auxiliary sea inlets and discharges in connection with the operation of machinery may be controlled locally. The controls shall be readily accessible and shall be provided with indicators showing whether the valves are open or closed.

(c) Scuppers and discharge pipes originating at any level and penetrating the shell either more than 17½ inches below the freeboard deck or less than 23½ inches above the summer load waterline shall be provided with a nonreturn valve at the shell. This valve, unless required by paragraph (a) of this section, may be omitted if the piping is of thickness as specified in Part 56 in Subchapter F (Marine Engineering) of this chapter.

(d) Scuppers leading from superstructures or deckhouses not fitted with doors complying with the requirements of § 42.15-10 shall be led overboard.

(e) All valves and shell fittings required by this section shall be of steel, bronze, or other approved ductile material. Valves of ordinary cast iron or similar material are not acceptable. All pipes to which this section refers shall be of steel or other equivalent material to the satisfaction of the assigning authority.

[CGFR 68-60, 33 FR 10062, July 12, 1968, as amended by CGFR 68-126, 34 FR 9014, June 5, 1969]

§ 42.15-65 Side scuttles.

(a) Side scuttles to spaces below the freeboard deck or to spaces within enclosed superstructures shall be fitted with efficient hinged inside deadlights arranged so that they can be effectively closed and secured watertight.

(b) No side scuttle shall be fitted in a position so that its sill is below a line drawn parallel to the freeboard deck at side and having its lowest point 2.5 percent of the breadth (B) above the load waterline, or 19½ inches, which ever is the greater distance.

(c) The side scuttles, together with their glasses, if fitted, and deadlights, shall be of substantial and approved construction.

[CGFR 68-60, 33 FR 10062, July 12, 1968]

§ 42.15-70 Freeing ports.

(a) Where bulwarks on the weather portions of freeboard or superstructure decks form wells, ample provision shall be made for rapidly freeing the deck of water and for draining them. Except as provided in paragraphs (b) and (c) of this section, the minimum freeing port area (A) on each side of the vessel for each well on the freeboard deck shall be that given by the following formulae in cases where the sheer in way of the well is standard or greater than standard. The minimum area for each well on superstructure decks shall be one-half of the area given by the formulae.

(1) Where the length of bulwark (l) in the well is 66 feet or less $A=7.6+0.115l$ (square feet)

(2) Where l exceeds 66 feet $A=0.23l$ (square feet)

(3) l need in no case be taken as greater than $0.7L$.

(4) If the bulwark is more than 3.9 feet in average height the required area shall be increased by 0.04 square feet per foot of length of well for each foot difference in height. If the bulwark is less than 3 feet in average height, the required area may be decreased by 0.04 square feet per foot of length for each foot difference in height.

(b) In vessels with no sheer the area calculated according to paragraph (a) of this section shall be increased by 50 percent. Where the sheer is less than the standard the percentage shall be obtained by linear interpolation.

(c) Where a vessel is fitted with a trunk which does not comply with the requirements of § 42.20-55(a)(5) or where continuous or substantially continuous hatchway side coamings are fitted between detached superstructures the minimum area of the freeing port openings shall be calculated from Table 42.15-70(c):

TABLE 42.15-70(c)

Breadth of hatchway or trunk in relation to the breadth of vessel	Area of freeing ports in relation to the total area of the bulwarks
40 percent or less	20 percent.
75 percent or more	10 percent.

NOTE: The area of freeing ports at intermediate breadths shall be obtained by linear interpolation.

(d) In vessels having superstructures which are open at either or both ends, adequate provision for freeing the space within such superstructures shall be provided to the satisfaction of the assigning authority.

(e) The lower edges of the freeing ports shall be as near the deck as practicable. Two-thirds of the freeing port area required shall be provided in the half of the well nearest the lowest point of the sheer curve.

(f) All such openings in the bulwarks shall be protected by rails or bars spaced approximately 9 inches apart. If shutters are fitted to freeing ports, ample clearance shall be provided to prevent jamming. Hinges shall have pins or bearings of noncorrodible material. If shutters are fitted with securing appliances, these appliances shall be of approved construction.

[CGFR 68-60, 33 FR 10062, July 12, 1968, as amended by CGFR 68-126, 34 FR 9014, June 5, 1969]

§ 42.15-75 Protection of the crew.

(a) The strength of the deckhouses used for the accommodation of the crew shall be to the satisfaction of the assigning authority.

(b) Efficient guard rails or bulwarks must be fitted on all exposed parts of the freeboard and superstructure decks as follows:

(1) The height of the bulwarks or guard rails must be at least 39½ inches from the deck, provided that where this height would interfere with the normal operation of the vessel, a lesser height may be approved if the Commandant and the assigning authority are satisfied that adequate protection is provided.

(2) On each vessel that is initially surveyed for load line assignment after January 1, 1976, and that is exclusively engaged in towing operations, the minimum bulwark or rail height on the freeboard deck may be reduced to 30 inches provided the assigning authority is satisfied that adequate grabrails are provided around the periphery of the deckhouse.

(3) Portable rails may be used when operating conditions warrant their use.

(c) The opening below the lowest course of the guard rails shall not exceed 9 inches. The other courses shall be not more than 15 inches apart. In the case of vessels with rounded gunwales the guard rail supports shall be placed on the flat of the deck.

(d) Satisfactory means (in the form of guard rails, life lines, gangways or underdeck passages, etc.) shall be provided for the protection of the crew in getting to and from their quarters, the machinery space and all other parts used in the necessary work of the vessel.

(e) Deck cargo carried on any vessel shall be so stowed that any opening which is in way of the cargo and which gives access to and from the crew's quarters, the machinery space and all other parts used in the necessary work of the vessel, can be properly closed and secured against the admission of water. Effective protection for the crew in the form of guard rails or life lines shall be provided above the deck cargo if there is no convenient passage on or below the deck of the vessel.

(46 U.S.C. 86-86; 46 U.S.C. 88-88; 49 CFR 1.4(a)(2))

[CGFR 68-60, 33 FR 10062, July 12, 1968, as amended by CGFR 68-126, 34 FR 9014, June 5, 1969; CGD 74-164, 41 FR 1470, Jan. 8, 1976]

§ 42.15-80 Special conditions of assignment for Type "A" vessels.

(a) *Machinery casings.* (1) Machinery casings on Type "A" vessels as defined in § 42.20-5 shall be protected by an enclosed poop or bridge of at least standard height, or by a deckhouse of equal height and equivalent strength, provided that machinery casings may be exposed if there are no openings giving direct access from the freeboard deck to the machinery space. A door complying with the requirements of § 42.15-10 may, however, be permitted in the machinery casing, provided that it leads to a space or passageway which is as strongly constructed as the casing and is separated from the stairway to the engine room by a second weathertight door of steel or other equivalent material.

(b) *Gangway and access.* (1) An efficiently constructed fore and aft permanent gangway of sufficient strength shall be fitted on Type "A" vessels at the level of the superstructure deck between the poop and the midship bridge or deckhouse where fitted, or equivalent means of access shall be provided to carry out the purpose of the gangway, such as passages below deck. Elsewhere, and on Type "A" vessels without a midship bridge, arrangements to the satisfaction of the assigning authority shall be provided to safeguard the crew in reaching all parts used in the necessary work of the ship.

(2) Safe and satisfactory access from the gangway level shall be available between separates crew accommodations and also between crew accommodations and the machinery space.

(c) *Hatchways.* Exposed hatchways on the freeboard and forecastle decks or on the tops of expansion trunks on Type "A" vessels shall be provided with efficient watertight covers of steel or other equivalent material.

(d) *Freeing arrangements.* (1) Type "A" vessels with bulwarks shall have open rails fitted for at least half the length of the exposed parts of the weather deck or other effective freeing arrangements. The upper edge of the sheer strake shall be kept as low as practicable.

(2) Where superstructures are connected by trunks, open rails shall be fitted for the whole length of the exposed parts of the freeboard deck.

[CGFR 68-60, 33 FR 10063, July 12, 1968, as amended by CGFR 68-126, 34 FR 9014, June 5, 1969]

Subpart 42.20—Freeboards

§ 42.20-1 Types of vessels.

(a) For the purposes of freeboard computation vessels shall be divided into Type "A" and Type "B".

[CGFR 68-60, 33 FR 10063, July 12, 1968]

§ 42.20-3 Required flooding and stability assumptions applicable to Type A and Type B vessels.

(a) The Assembly of the Intergovernmental Maritime Consultative Organization on November 28, 1968, made certain recommendations for uniform application and interpretation of Regulation 27 of the International Convention on Load Lines, 1966. The United States participated in and accepted these recommentations which are, in effect, directly transcribed below in this section and their applicability indicated.

(b) The ship in the intact condition is assumed to have no trim.

(c) In applying §§ 42.20-5(b), 42.20-10 (c), (d), and (f) when calculating subdivision, account should be taken of the following assumptions:

(1) The vertical extent of damage in all cases is assumed to be equal to the depth of the ship at the flooded compartment under consideration. The buoyancy of any superstructure or deckhouse directly above the flooded compartment is to be disregarded.

(2) The transverse extent of damage is equal to B/5, measured inboard from the side of the ship perpendicularly to the center line at the level of the summer load waterline. If damage of a lesser extent results in a more severe condition such lesser extent should be assumed.

(3) Transverse bulkheads; damage and flooding assumptions:

(i) No main transverse bulkhead is assumed damaged except where in § 42.20-10(f) the flooding of any two adjacent fore and aft compartments is envisaged; in addition the damage may be located between two transverse bulkheads bounding side tanks.

(ii) If in a transverse bulkhead there are steps or recesses of not more than 10 feet in length located within the extent of transverse penetration of damage as defined in paragraph (c)(2) of this section. Such transverse bulkheads may be considered intact and the adjacent compartments may be floodable singly. If, however, within the extent of penetration of damage there is a step or recess of more than 10 feet in length in a transverse bulkhead, the two compartments adjacent to this bulkhead should be considered as flooded.

(4) If a double bottom or side tank is divided by a transverse bulkhead located more than 10 feet from a main transverse bulkhead, the adjacent double bottom or side tank should be considered as flooded. If this side tank has openings into the holds, such holds should also be considered as flooded. This provision is applicable even where such openings are fitted with closing appliances.

(d) Calculations; bulkhead spacing applicable to § 42.20-10(f):

(1) In applying § 42.20-10(f), the calculations for the flooded condition should be based on the assumptions specified in paragraph (c) of this section. To be considered effective main transverse watertight bulkheads should be spaced at least 10 feet +0.03L, or 35 feet whichever is the lesser.

(2) Where transverse bulkheads are spaced a lesser distance, one or more of these bulkheads should be assumed as nonexistent in order to achieve the minimum spacing between bulkheads.

(e) In applying §§ 42.20-5(b), 42.20-10 (c), (d), and (f) the specified conditions after flooding, as determined by paragraphs (c) and (d) of this section, should be defined as follows:

(1) The final waterline after flooding taking into account sinkage, heel, and trim is to be below the lower edge of any opening through which progressive flooding may take place. Such openings should include air pipes and those which are closed by means of weathertight doors (even if they comply with § 42.15-10) or covers (even if they comply with § 42.15-30 or § 42.15-45(d)), and may exclude those openings closed by means of manhole covers and flush scuttles (which comply with § 42.15-40), cargo hatch covers of the type described in § 42.20-5(a), watertight doors which are secured closed while at sea and so logged, remotely operated sliding watertight doors, and side scuttles of the nonopening type (which comply with § 42.15-65).

(2) If pipes, ducts, or tunnels are situated within the assumed extent of penetration of damage as defined in paragraph (c)(2) of this section, arrangements should be made so that flooding cannot thereby extend beyond the limits assumed for the calculations of the damaged conditions.

(3) In applying § 42.20-5(b)(2), the angle of heel due to unsymmetrical flooding should not exceed 15°. Since § 42.20-5(b)(2) states that the maximum angle of heel is to be of the order of 15°, if no part of the deck is immersed, an angle of heel of up to 17° may be accepted.

(4) When any part of the deck beyond the limits of flooding is immersed or in any case where the margin of stability in the flooded condition may be considered doubtful, the dynamic stability should be investigated. The dynamic stability may be regarded as sufficient if the righting lever curve has a minimum range of 20° beyond the position of equilibrium in association with a righting lever of at least 0.33 feet.

(5) After flooding, the metacentric height as calculated by the constant displacement method should be at least 2 inches in the upright condition.

(f) Center of gravity, free surface, and loading assumptions:

(1) The height of the center of gravity above base line is assessed allowing for homogeneous loading of all spaces designed to contain cargo and 50 percent of the individual total capacity of all tanks and spaces fitted to contain consumable fluids and ship's stores.

(2) In calculating the height of the center of gravity account should be taken of corrections for free surfaces of consumable liquids. In calculating these corrections it should be assumed that, for each type of liquid, at least one transverse pair of a single center line tank has a free surface and the tank or combination of tanks to be taken into account should be those where the effect of free surfaces is the greatest.

(3) The remaining consumable liquid tanks should be assumed either completely empty or completely filled, and the distribution of the liquids between these tanks should be effected so as to obtain the greatest possible height above the keel for the center of gravity.

(4) The effect of free surface in compartments containing fluid cargoes which may exist in the normal full load condition should be taken into account.

(5) Weights should be calculated on the basis of the following values:

Salt water	35.00 cubic feet per long ton.
Fresh water	35.88 cubic feet per long ton.
Oil fuel	37.77 cubic feet per long ton.
Diesel oil	39.86 cubic feet per long ton.
Lubricating oil	39.86 cubic feet per long ton.

(g) With regard to tanks situated in the machinery compartments and designed to contain consumable liquids, such as fuel oil and diesel oil, lubricating oil, and fresh water, unless the dynamic stability is required to be investigated in accordance with paragraph (e)(4) of this section, or where the heeling moment due to unsymmetrical flooding of these tanks is appreciable, such tanks will be assumed not to be floodable.

[CGFR 68-126, 34 FR 9014, June 5, 1969; 34 FR 9753, June 24, 1969]

§ 42.20–5 Type "A" vessels.

(a) A Type "A" vessel is one which is designed to carry only liquid cargoes in bulk, and in which cargo tanks have only small access openings closed by watertight gasketed covers of steel or equivalent material. Such a vessel necessarily has the following inherent features:

(1) High integrity of the exposed deck; and

(2) High degree of safety against flooding, resulting from the low permeability of loaded cargo spaces and the degree of subdivision usually provided.

(a-1) A vessel that meets the requirements in 33 CFR 157.21 46 CFR 153.20, 153.21, 153.22, or 154.210 is considered by the Coast Guard as meeting the requirements in this section.

(b) A Type "A" vessel, if over 492 feet in length, and designed to have empty compartments when loaded to its summer load waterline, shall be able to withstand the flooding of any one of these empty compartments at an assumed permeability of 0.95, and remain afloat in a condition of equilibrium considered to be satisfactory by the assigning authority. In such a vessel, if over 738 feet in length, the machinery space shall be treated as a floodable compartment but with a permeability of 0.85. For guidance the following limits may be regarded as satisfactory:

(1) The final waterline after flooding is below the lower edge of any opening through which progressive flooding may take place.

(2) The maximum angle of heel due to unsymmetrical flooding is of the order of 15 degrees.

(3) The metacentric height in the flooded condition is positive.

(c) A Type "A" vessel shall be assigned a freeboard not less than that based on Table 42.20–15(a)(1).

[CGFR 68-60, 33 FR 10063, July 12, 1968, as amended by CGFR 68-126, 34 FR 9015, June 5, 1969; CGD 74-32C, 40 FR 48288, Oct. 14, 1975; CGD 73-96, 42 FR 49024, Sept. 26, 1977]

§ 42.20–10 Type "B" vessels.

(a) All vessels which do not come within the provisions regarding Type "A" vessels in § 42.20–5 (a) and (b) shall be considered as Type "B" vessels.

(b) Type "B" vessels, which in position 1 have hatchways fitted with hatch covers complying with the requirements of § 42.15–25(d)(1) or § 42.15–30 shall, except as provided in paragraphs (c) to (g), inclusive, of this section be assigned freeboards based on Table 42.20–15(b)(1).

(c) Any Type "B" vessels of over 328 feet in length may be assigned freeboards less than those required under paragraph (b) of this section provided that, in relation to the amount of reduction granted, the assigning authority is satisfied that:

(1) The measures provided for the protection of the crew are adequate;

(2) The freeing arrangements are adequate:

(3) The covers in positions 1 and 2 comply with the provisions of § 42.15–30 and have adequate strength; special care being given to their sealing and securing arrangements;

(4) The vessel, when loaded to its summer load waterline, will remain afloat in a satisfactory condition of equilibrium after flooding of any single damaged compartment at an assumed permeability of 0.95 excluding the machinery space; and

(5) In such a vessel, if over 738 feet in length, the machinery space shall be treated as a floodable compartment but with a permeability of 0.85.

(d) For guidance in applying paragraphs (c) (4) and (5) of this section the limits given in § 42.20–5(b) (1), (2) and (3) may be regarded as satisfactory. Also, the relevant calculations may be based upon the following main assumptions:

(1) The vertical extent of damage is equal to the depth of the vessel;

(2) The penetration of damage is not more than *B*/5;

(3) No main transverse bulkhead is damaged;

(4) The height of the center of gravity above the base line is assessed allowing for homogeneous loading of cargo holds, and for 50 percent of the designed capacity of consumable fluids and stores, etc.

(e) In calculating the freeboards for Type "B" vessels which comply with the requirements of paragraph (c) of this section the values from Table 42.20-15(b)(1) shall not be reduced by more than 60 percent of the difference between the "B" and "A" tabular values for the appropriate vessel lengths.

(f) The reduction in tabular freeboard allowed under paragraph (e) of this section may be increased up to the total difference between the values in Table 42.20-15(a)(1) and those in Table 42.20-15(b)(1) on condition that the vessel complies with the requirements of § 42.15-80(a)(1), (b)(1), (b)(2), (d)(1), and (d)(2), as if it were a Type "A" vessel, and further complies with the provisions of paragraph (c)(1) to (4), inclusive of this section, except that the reference in paragraph (c)(4) of this section to the flooding of any single damaged compartment shall be treated as a reference to the flooding of any two adjacent fore and aft compartments, neither of which is the machinery space. Also any such vessel of over 738 feet in length, when loaded to its summer load waterline, shall remain afloat in a satisfactory condition of equilibrium after flooding of the machinery space, taken alone, at an assumed permeability of 0.85.

(g) Type "B" vessels, which in position 1 have hatchways fitted with hatch covers which comply with the requirements of § 42.15-25, other than paragraph (d)(1) of that section, shall be assigned freeboards based upon the values given in Table 42.20-15(b)(1) increased by the values given in Table 42.20-10(g):

TABLE 42.20-10(g)—FREEBOARD INCREASE OVER TABULAR FREEBOARD FOR TYPE "B" VESSELS, FOR VESSEL WITH HATCH COVERS NOT COMPLYING WITH § 42.15 25(d)(1) OR § 42.15-30.

Length of vessel (feet)	Freeboard increase [1] (inches)
350 and below	2.0
360	2.3
370	2.6
380	2.9
390	3.3
400	3.7
410	4.2
420	4.7
430	5.2
440	5.8
450	6.4
460	7.0
470	7.6
480	8.2
490	8.7
500	9.2
510	9.6
520	10.0
530	10.4
540	10.7
550	11.0
560	11.4
570	11.8
580	12.1
590	12.5
600	12.8
610	13.1
620	13.4
630	13.6
640	13.9
650	14.1
660	14.3
660 [2]	

[1] Freeboards at intermediate lengths of vessel shall be obtained by linear interpolation.

[2] Vessels above 660 feet in length shall be dealt with by the Commandant.

(h) A lighter barge, or other vessel without independent means of propulsion shall be assigned a freeboard in accordance with the provisions of the regulations in this Part. However, in the case of barges which are unmanned the requirements of §§ 42.15-75, 42.15-80(b), and 42.20-70 shall not apply. Such unmanned barges which have on the freeboard deck only small access openings closed by watertight gasketed covers of steel or equivalent material may be assigned freeboards 25 percent less than those calculated in accordance with the applicable regulations in this Part 42.

[CGFR 68-60, 33 FR 10063, July 12, 1968, as amended by CGFR 68-126, 34 FR 9015, June 5, 1969]

§ 42.20-15 Freeboard tables.

(a) *Type "A" vessel.* (1) The tabular freeboard for Type "A" vessel shall be determined from Table 42.20-15(a)(1):

TABLE 42.20-15(a)(1)—FREEBOARD TABLE FOR TYPE "A" VESSELS

Length of vessel (feet)	Freeboard [1] (inches)
80	8.0
90	8.9
100	9.8
110	10.8
120	11.9
130	13.0
140	14.2
150	15.5
160	16.9
170	18.3
180	19.8
190	21.3
200	22.9
210	24.5
220	26.2
230	27.8
240	29.5
250	31.1
260	32.8
270	34.6
280	36.3
290	38.0
300	39.7
310	41.4
320	43.2
330	45.0
340	46.9
350	48.8
360	50.7
370	52.7
380	54.7
390	56.8
400	58.8
410	60.9
420	62.9
430	65.0
440	67.0
450	69.1
460	71.1
470	73.1
480	75.1
490	77.1
500	79.0
510	80.9
520	82.7
530	84.5
540	86.3
550	88.0
560	89.6
570	91.1
580	92.6
590	94.1
600	95.5
610	96.9
620	98.3
630	99.6
640	100.9
650	102.1
660	103.3
670	104.4
680	105.5
690	106.6
700	107.7
710	108.7
720	109.7
730	110.7
740	111.7
750	112.6
760	113.5
770	114.4
780	115.3
790	116.1
800	117.0
810	117.8
820	118.6
830	119.3
840	120.1
850	120.7
860	121.4
870	122.1
880	122.7
890	123.4
900	124.0
910	124.6
920	125.2
930	125.7
940	126.2
950	126.7
960	127.2
970	127.7
980	128.1
990	128.6
1,000	129.0
1,010	129.4
1,020	129.9
1,030	130.3
1,040	130.7
1,050	131.0
1,060	131.4
1,070	131.7
1,080	132.0
1,090	132.3
1,100	132.6
1,110	132.9
1,120	133.2
1,130	133.5
1,140	133.8
1,150	134.0
1,160	134.3
1,170	134.5
1,180	134.7
1,190	135.0
1,200	135.2
1,200 [2]	

[1] Freeboards at intermediate lengths of vessels shall be obtained by linear interpolation.

[2] Vessels above 1,200 feet in length shall be dealt with by the Commandant.

(b) *Type "B" vessels.* (1) The tabular freeboard for Type "B" vessels shall be determined from Table 42.20-15(b)(1):

TABLE 42.20-15(b)(1)—FREEBOARD TABLE FOR TYPE "B" VESSELS

Length of vessel (feet)	Free-board[1] (inches)
80	8.0
90	8.9
100	9.8
110	10.8
120	11.9
130	13.0
140	14.2
150	15.5
160	16.9
170	18.3
180	19.8
190	21.3
200	22.9
210	24.7
220	26.6
230	28.5
240	30.4
250	32.4
260	34.4
270	36.5
280	38.7
290	41.0
300	43.3
310	45.7
320	48.2
330	50.7
340	53.2
350	55.7
360	58.2
370	60.7
380	63.2
390	65.7
400	68.2
410	70.7
420	73.2
430	75.7
440	78.2
450	80.7
460	83.1
470	85.6
480	88.1
490	90.6
500	93.1
510	95.6
520	98.1
530	100.6
540	103.0
550	105.4
560	107.7
570	110.0
580	112.3
590	114.6
600	116.8
610	119.0
620	121.1
630	123.2
640	125.3
650	127.3
660	129.3
670	131.3
680	133.3
690	135.3
700	137.1
710	139.0
720	140.9
730	142.7
740	144.5
750	146.3
760	148.1
770	149.8
780	151.5
790	153.2
800	154.8
810	156.4
820	158.0
830	159.6
840	161.2
850	162.8
860	164.3
870	165.9
880	167.4
890	168.9
900	170.4
910	171.8
920	173.3
930	174.7
940	176.1
950	177.5
960	178.9
970	180.3
980	181.7
990	183.1
1,000	184.4
1,010	185.8
1,020	187.2
1,030	188.5
1,040	189.8
1,050	191.0
1,060	192.3
1,070	193.5
1,080	194.8
1,090	196.1
1,100	197.3
1,110	198.6
1,120	199.9
1,130	201.2
1,140	202.3
1,150	203.5
1,160	204.6
1,170	205.8
1,180	206.9
1,190	208.1
1,200	209.3
1,200[2]	

[1] Freeboards at intermediate lengths of vessel shall be obtained by linear interpolation.

[2] Vessels above 1,200 feet in length shall be dealt with by the Commandant.

[CGFR 68-60, 33 FR 10064, July 12, 1968, as amended by CGFR 68-126, 34 FR 9015, June 5, 1969]

§ 42.20-20 Correction to the freeboard for vessels under 328 feet in length.

(a) The tabular freeboard for a Type "B" vessel of between 79 feet and 328 feet in length having enclosed superstructures with an effective length of up to 35 percent of the length of the vessel shall be increased by:

$$0.09\ (328-L)\ [0.35-(E/L)]\ \text{inches}$$

where:
L=length of vessel in feet.
E=effective length of superstructure in feet as defined in § 42.20-50.

[CGFR 68-60, 33 FR 10064, July 12, 1968]

§ 42.20-25 Correction for block coefficient.

(a) Where the block coefficient (C_b) exceed 0.68, the tabular freeboard specified in § 42.20-15 as modified, if applicable by §§ 42.20-10 (e), (g), and 42.20-20(a) shall be multiplied by the factor $(C_b+0.68)/1.36$.

[CGFR 68-60, 33 FR 10064, July 12, 1968]

§ 42.20-30 Correction for depth.

(a) Where D exceeds $L^1/_{15}$ the freeboard shall be increased by $[D-(L/15)]$ R inches, where R is $L/131.2$ at lengths less than 393.6 feet and 3 at 393.6 feet length and above.

(b) Where D is less than $L/15$ no reduction shall be made except in a vessel with an enclosed superstructure covering at least $0.6L$ amidships, with a complete trunk, or combination of detached enclosed superstructures and trunks which extend all fore and aft, where the freeboard shall be reduced at the rate prescribed in paragraph (a) of this section.

(c) Where the height of superstructure or trunk is less than the standard height, the reduction shall be in the ratio of the actual to the standard height as defined in § 42.20-40.

[CGFR 68-60, 33 FR 10064, July 12, 1968]

§ 42.20-35 Correction for position of deck line.

(a) Where the actual depth to the upper edge of the deck line is greater or less than D, the difference between the depths shall be added to or deducted from the freeboard.

[CGFR 68-60, 33 FR 10065, July 12, 1968]

§ 42.20-40 Standard height of superstructure.

(a) The standard height of a superstructure shall be as given in Table 42.20-40(a):

TABLE 42.20-40(a) STANDARD HEIGHTS (IN FEET) [1]

Length (L) (in feet)	Raised quarter deck	All other super structures
98.5 or less	3.0	5.9
246	3.9	5.9
410 or more	5.9	7.5

[1] The standard heights at intermediate lengths of the vessel shall be obtained by linear interpolation.

[CGFR 68-60, 33 FR 10065, July 12, 1968, as amended by CGFR 68-126, 34 FR 9015, June 5, 1969]

§ 42.20-45 Length of superstructure.

(a) Except as provided in paragraph (b) of this section, the length of a superstructure (S) shall be the mean length of the parts of the superstructure which lie within the length (L).

(b) Where the end bulkhead of an enclosed superstructure extends in a fair convex curve beyond its intersection with the superstructure sides, the length of the superstructure may be increased on the basis of an equivalent plane bulkhead. This increase shall be two-thirds of the fore and aft extent of curvature. The maximum curvature which may be taken into account in determining this increase is one-half the breadth of the superstructure at the point of intersection of the curved end of the superstructure with its side.

[CGFR 68-60, 33 FR 10065, July 12, 1968, as amended by CGFR 68-126, 34 FR 9015, June 5, 1969]

§ 42.20-50 Effective length of superstructure.

(a) Except as provided for in paragraph (b) of this section the effective length (E) of an enclosed superstructure of standard height shall be its length.

(b) In all cases where an enclosed superstructure of standard height is set in from the sides of the vessel as permitted in § 42.13-15(j), the effective length shall be the length modified by the ratio of b/Bs,

where:
"b" is the breadth of the superstructure at the middle of its length;

"*Bs*" is the breadth of the vessel at the middle of the length of the superstructure.

(1) Where a superstructure is set in for a part of its length, this modification shall be applied only to the set in part.

(c) Where the height of an enclosed superstructure is less than the standard height, the effective length shall be its length reduced in the ratio of the actual height to the standard height. Where the height exceeds the standard, no increase shall be made to the effective length of the superstructure.

(d) The effective length of a raised quarter deck if fitted with an intact front bulkhead, shall be its length up to a maximum of 0.6*L*. Where the bulkhead is not intact, the raised quarter deck shall be treated as a poop of less than standard height.

(e) Superstructures which are not enclosed shall have no effective length.

[CGFR 68-60, 33 FR 10065, July 12, 1968]

§ 42.20-55 Trunks.

(a) A trunk or similar structure which does not extend to the sides of the vessel shall be regarded as efficient on the following conditions:

(1) The trunk is at least as strong as a superstructure;

(2) The hatchways are in the trunk deck, and the hatchway coamings and covers comply with the requirements of §§ 42.15-15 to 42.15-30, inclusive, and the width of the trunk deck stringer provides a satisfactory gangway and sufficient lateral stiffness; however, small access openings with watertight covers may be permitted in the freeboard deck;

(3) A permanent working platform fore and aft fitted with guard rails is provided by the trunk deck, or by detached trunks connected to superstructures by efficient permanent gangways;

(4) Ventilators are protected by the trunk by watertight covers or by other equivalent means;

(5) Open rails are fitted on the weather parts of the freeboard deck in way of the trunk for at least half their length;

(6) The machinery casings are protected by the trunk, by a superstructure of at least standard height, or by a deckhouse of the same height and of equivalent strength;

(7) The breadth of the trunk is at least 60 percent of the breadth of the vessel; and,

(8) Where there is no superstructure, the length of the trunk is at least 0.6*L*.

(b) The full length of an efficient trunk reduced in the ratio of its mean breadth to *B* shall be its effective length.

(c) The standard height of a trunk is the standard height of a superstructure other than a raised quarter deck.

(d) Where the height of a trunk is less than the standard height, its effective length shall be reduced in the ratio of the actual to the standard height. Where the height of hatchway coamings on the trunk deck is less than that required under § 42.15-25(a), a reduction from the actual height of trunk shall be made which corresponds to the difference between the actual and required height of coaming.

[CGFR 68-60, 33 FR 10065, July 12, 1968, as amended by CGFR 68-126, 34 FR 9015, June 5, 1969]

§ 42.20-60 Deduction for superstructures and trunks.

(a) Where the effective length of superstructures and trunks is 1.0*L*, the deduction from the freeboard shall be 14 inches at 79 feet length of vessel, 34 inches at 279 feet length, and 42 inches at 400 feet length and above; deductions at intermediate lengths shall be obtained by linear interpolation.

(b) Where the total effective length of superstructures and trunks is less than 1.0*L* the deduction shall be a percentage obtained from Table 42.20-60(b)(1) or Table 42.20-60(b)(2):

TABLE 42.20-60(b)(1)—PERCENTAGE OF DEDUCTION FOR TYPE "A" VESSELS

	Total effective length of superstructures and trunks										
	0	0.1*L*	0.2*L*	0.3*L*	0.4*L*	0.5*L*	0.6*L*	0.7*L*	0.8*L*	0.9*L*	1.0*L*
Percentage of deduction for all types of superstructures [1]	0	7	14	21	31	41	52	63	75.3	87.7	100

[1] Percentages at intermediate lengths of superstructures and trunks shall be obtained by linear interpolation.

TABLE 42.20-60(b)(2)—PERCENTAGE OF DEDUCTION FOR TYPE "B" VESSELS

[*Percentage of deduction* [1]]

	Total effective length of superstructures and trunks											
	Line	0	0.1*L*	0.2*L*	0.3*L*	0.4*L*	0.5*L*	0.6*L*	0.7*L*	0.8*L*	0.9*L*	1.0*L*
Vessels with forecastle and without detached bridge	I	0	5	10	15	23.5	32	46	63	75.3	87.7	100
Vessels with forecastle and detached bridge	II	0	6.3	12.7	19	27.5	36	46	63	75.3	87.7	100

[1] Percentages at intermediate lengths of superstructures and trunks shall be obtained by linear interpolation.

(c) For vessels of Type "B":

(1) Where the effective length of a bridge is less than 0.2*L*, the percentages shall be obtained by linear interpolation between lines I and II;

(2) Where the effective length of a forecastle is more than 0.4*L*, the percentages shall be obtained from line II; and,

(3) Where the effective length of a forecastle is less than 0.07*L*, the percentages in Table 42.20-60(b)(2) of this paragraph shall be reduced by:

$$5(0.07L-f)/0.07L$$

L is the length of vessel as defined in § 42.13-15(a),
f is the effective length of the forecastle.

[CGFR 68-60, 33 FR 10065, July 12, 1968, as amended by CGFR 68-126, 34 FR 9015, June 5, 1969]

§ 42.20-65 Sheer.

(a) *General.* (1) The sheer shall be measured from the deck at side to a line of reference drawn parallel to the keel through the sheer line amidships.

(2) In vessels designed with a rake of keel, the sheer shall be measured in relation to a reference line drawn parallel to the design load waterline.

(3) In flush deck vessels and in vessels with detached superstructures the sheer shall be measured at the freeboard deck.

(4) In vessels with topsides of unusual form in which there is a step or break in the topsides, the sheer shall be considered in relation to the equivalent depth amidships.

(5) In vessels with a superstructure of standard height which extends over the whole length of the freeboard deck, the sheer shall be measured at the superstructure deck. Where the height exceeds the standard the least difference (Z) between the actual and standard heights shall be added to each end ordinate. Similarly, the intermediate ordinates at distances of ⅙*L* and ⅓*L* from each perpendicular shall be increased by 0.444Z and 0.111Z respectively.

(6) Where the deck of an enclosed superstructure has at least the same sheer as the exposed freeboard deck, the sheer of the enclosed portion of the freeboard deck shall not be taken into account.

(7) Where an enclosed poop or forecastle is of standard height with greater sheer than that of the freeboard deck, or is of more than standard height, an addition to the sheer of the freeboard deck shall be made as provided in paragraph (c)(4) of this section.

(b) *Standard sheer profile.* (1) The ordinates of the standard sheer profile are given in Table 42.20-65(b)(1):

TABLE 42.20–65(b)(1)—STANDARD SHEER PROFILE

[Where L is in feet]

	Station	Ordinate (in inches)	Ordinate (in inches)	Factor
After half	After Perpendicular.	0.1	$L+10$	1
	⅙ L from A.P	0.0444	$L+4.44$	3
	⅓ L from A.P	0.0111	$L+1.11$	3
	Amidships		0	1
Forward half.	Amidships		0	1
	⅓ L from F.P	0.0222	$L+2.22$	3
	⅙ L from F.P	0.0888	$L+8.88$	3
	Forward Perpendicular.	0.2	$L+20$	1

(c) *Measurement of variation from standard sheer profile.* (1) Where the sheer profile differs from the standard, the four ordinates of each profile in the forward or after half shall be multiplied by the appropriate factors given in the table of ordinates. The difference between the sums of the respective products and those of the standard divided by 8 measures the deficiency or excess of sheer in the forward or after half. The arithmetical mean of the excess or deficiency in the forward and after halves measures the excess or deficiency of sheer.

(2) Where the after half of the sheer has an excess and the forward half of the sheer has a deficiency, no credit shall be allowed for the part in excess and deficiency only shall be measured.

(3) Where the forward half of the sheer profile exceeds the standard, and the after portion of the sheer profile is not less than 75 percent of the standard, credit shall be allowed for the part in excess; where the after part is less than 50 percent of the standard, no credit shall be given for the excess sheer forward. Where the after sheer is between 50 percent and 75 percent of the standard, intermediate allowances may be granted for excess sheer forward.

(4) Where sheer credit is given for a poop or forecastle, the following formula shall be used:

$$s=y/3)(L'/L)$$

where:

s=sheer credit, to be deducted from the deficiency or added to the excess of sheer.

y=difference between actual and standard height of superstructure at the end ordinate.

L'=mean enclosed length of poop or forecastle up to a maximum length of $0.5L$.

L=length of vessel as defined in § 42.13-15(a).

(i) The formula in this paragraph (c)(4) of this section provides a curve in the form of a parabola tangent to the actual sheer curve at the free-board deck and intersecting the end ordinate at a point below the super-structure deck a distance equal to the standard height of a superstructure. The superstructure deck shall not be less than standard height above this curve at any point. This curve shall be used in determining the sheer profile for forward and after halves of the vessel.

(d) *Correction for variations from standard sheer profile.* (1) The correction for sheer shall be the deficiency or excess of sheer (see paragraphs (c)(1) to (4) inclusive of this section) multiplied by:

$$0.75-(S/2L)$$

where:

S is the total length of enclosed super-structures.

(e) *Addition for deficiency in sheer.* (1) Where the sheer is less than the standard, the correction for deficiency in sheer (see paragraph (d)(1) of this section) shall be added to the freeboard.

(f) *Deduction for excess sheer.* (1) In vessels where an enclosed superstructure covers $0.1L$ before and $0.1L$ abaft amidships, the correction for excess of sheer as calculated under the provisions of paragraph (d)(1) of this section shall be deducted from the freeboard; in vessels where no enclosed superstructure covers amidships, no deduction shall be made from the freeboard; where an enclosed superstructure covers less than $0.1L$ before and $0.1L$ abaft amidships, the deduction shall be obtained by linear interpolation. The maximum deduction for excess sheer shall be at the rate of 1½ inches per 100 feet of length.

[CGFR 68-60, 33 FR 10066, July 12, 1968, as amended by CGFR 68-126, 34 FR 9016, June 5, 1969]

§ 42.20–70 Minimum bow height.

(a) The bow height defined as the vertical distance at the forward perpendicular between the waterline corresponding to the assigned summer freeboard and the designed trim and the top of the exposed deck at side shall be not less than:

(1) For vessels below 820 feet in length,

$$0.672L[1-(L/1640)][1.36/(C_b+0.68)] \text{ inches;}$$

where:

L is the length of the vessel in feet.

C_b is the block coefficient which is to be taken as not less than 0.68.

(2) For vessels of 820 feet and above in length,

$$275.6[1.36/(C_b+0.68)] \text{ inches;}$$

where:

C_b is the block coefficient which is to be taken as not less than 0.68.

(b) Where the bow height required in paragraph (a) of this section is obtained by sheer, the sheer shall extend for at least 15 percent of the length of the vessel measured from the forward perpendicular. Where it is obtained by fitting a superstructure, such superstructure shall extend from the stem to a point at least 0.07L abaft the forward perpendicular, and it shall comply with the following requirements:

(1) For vessels not over 328 feet in length it shall be enclosed as defined in § 42.13–15(j); and,

(2) For vessels over 328 feet in length it need not comply with § 42.13–15(j) but shall be fitted with closing appliances to the satisfaction of the assigning authority.

(c) Vessels which, to suit exceptional operational requirements, cannot meet the requirements of paragraphs (a) and (b) of this section may be given special consideration by the assigning authority.

[CGFR 68-60, 33 FR 10066, July 12, 1968, as amended by CGFR 68-126, 34 FR 9016, June 5, 1969]

§ 42.20–75 Minimum freeboards.

(a) *Summer freeboard.* (1) The minimum freeboard in summer shall be the freeboard derived from the tables in § 42.20–15, as modified by the corrections in §§ 42.20–5 and 42.20–10, as applicable, §§ 42.20–20, 42.20–25, 42.20–30, 42.20–35, 42.20–60, 42.20–65 and, if applicable, § 42.20–70.

(2) The freeboard in salt water, as calculated in accordance with paragraph (a)(1) of this section, but without the correction for deck line, as provided by § 42.20–35, shall not be less than 2 inches. For vessels having in position 1 hatchways with covers which do not comply with the requirements of §§ 42.15–25(d)(1), 42.15–30, or 42.15–80, the freeboard shall be not less than 6 inches.

(b) *Tropical freeboard.* (1) The minimum tropical freeboard shall be the freeboard obtained by a deduction from the summer freeboard of one forty-eighth of the summer draft measured from the top of the keel to the center of the ring of the load line mark.

(2) The freeboard in salt water, as calculated in accordance with paragraph (b)(1) of this section, but without the correction for deck line, as provided by § 42.20–35, shall not be less than 2 inches. For vessels having in position 1 hatchways with covers which do not comply with the requirements of § 42.15–25(d)(1), § 42.15–30, or § 42.15–80, the freeboard shall be not less than 6 inches.

(c) *Winter freeboard.* (1) The minimum winter freeboard shall be the freeboard obtained by an addition to the summer freeboard of one forty-eighth of summer draft, measured from the top of the keel to the center of the ring of the load line mark.

(d) *Winter North Atlantic freeboard.* (1) The minimum freeboard for vessels of not more than 328 feet in length which enter any part of the North Atlantic defined in § 42.30–35 during the winter seasonal period shall be the winter freeboard plus 2 inches. For other vessels the winter North Atlantic freeboard shall be the winter freeboard.

(e) *Fresh water freeboard.* (1) The minimum freeboard in fresh water of unit density shall be obtained by deducting from the minimum freeboard in salt water:

$$(\Delta/40\ T)\ \text{inches}$$

where:

Δ=displacement in salt water in tons at the summer load waterline; and,

T=tons per inch immersion in salt water at the summer load waterline.

(2) Where the displacement at the summer load waterline cannot be certified, the deduction shall be one forty-eighth of summer draft, measured from the top of the keel to the center of the ring of the load line mark.

[CGFR 68-60, 33 FR 10066, July 12, 1968, as amended by CGFR 68-126, 34 FR 9016, June 5, 1969]

Subpart 42.25—Special Requirements for Vessels Assigned Timber Freeboards

§ 42.25-1 Application of this subpart.

(a) The provisions of this Subpart 42.25 apply only to vessels to which timber load lines are assigned.

[CGFR 68-60, 33 FR 10067, July 12, 1968]

§ 42.25-5 Definitions of terms used in this subpart.

(a) *Timber deck cargo.* The term "timber deck cargo" means a cargo of timber carried on an uncovered part of a freeboard or superstructure deck. The term does not include wood pulp or similar cargo.

(b) *Timber load line.* A timber deck cargo may be regarded as giving a vessel a certain additional buoyancy and a greater degree of protection against the sea. For that reason, vessels carrying a timber deck cargo may be granted a reduction of freeboard calculated according to the provisions of § 42.25-20 and marked on the vessel's side in accordance with the provisions of § 42.13-30(c) and (d). However, in order that such special freeboard may be granted and used, the timber deck cargo shall comply with certain conditions which are laid down in § 42.25-15, and the vessel itself shall also comply with certain conditions relating to its construction which are set out in § 42.25-10.

[CGFR 68-60, 33 FR 10067, July 12, 1968, as amended by CGFR 68-126, 34 FR 9016, June 5, 1969]

§ 42.25-10 Construction of vessel.

(a) *Superstructure.* (1) Vessels, shall have a forecastle of at least standard height and a length of at least 0.07*L*. In addition, if the vessel is less than 328 feet in length, a poop of at least standard height, or a raised quarter deck with either a deckhouse or a strong steel hood of at least the same total height shall be fitted aft.

(b) *Double bottom tanks.* (1) Double bottom tanks where fitted within the midship half length of the vessel shall have adequate watertight longitudinal subdivision.

(c) *Bulwarks.* (1) The vessel shall be fitted either with permanent bulwarks at least 39½ inches in height, specially stiffened on the upper edge and supported by strong bulwark stays attached to the deck and provided with necessary freeing ports, or with efficient rails of the same height and of specially strong construction.

[CGFR 68-60, 33 FR 10067, July 12, 1968, as amended by CGFR 68-126, 34 FR 9016, June 5, 1969]

§ 42.25-15 Stowage.

(a) *General.* (1) Openings in the weather deck over which cargo is stowed shall be securely closed and battened down. The ventilators shall be efficiently protected.

(2) Timber deck cargo shall extend over at least the entire available length which is the total length of the well or wells between superstructures. Where there is no limiting superstructure at the after end, the timber shall extend at least to the after end of the aftermost hatchway. The timber shall be stowed as solidly as possible, to at least the standard height of a superstructure other than a raised quarter deck.

(3) On a vessel within a seasonal winter zone in winter, the height of the deck cargo above the weather deck shall not exceed one-third of the extreme breadth of the vessel.

(4) The timber deck cargo shall be compactly stowed, lashed, and secured. It shall not interfere in any way with

the navigation and necessary work of the vessel.

(b) *Upright.* (1) Uprights, when required by the nature of the timber, shall be of adequate strength considering the breadth of the vessel; the spacing shall be suitable for the length and character of timber carried, but shall not exceed 9.8 feet. Strong angles or metal sockets or equally efficient means shall be provided for securing the uprights.

(c) *Lashings.* (1) Timber deck cargo shall be efficiently secured throughout its length by independent overall lashings spaced not more than 9.8 feet apart. Eye plates for these lashings shall be efficiently attached to the sheer strake or to the deck stringer plate at intervals of not more than 9.8 feet. The distance from an end bulkhead of a superstructure to the first eye plate shall be not more than 6.6 feet. Eye plates and lashings shall be provided 23½ inches and 4.9 feet from the ends of timber deck cargoes where there is no bulkhead.

(2) Lashings shall be not less than ¾-inch close link chain or flexible wire rope of equivalent strength, fitted with sliphooks and turnbuckles, which shall be accessible at all times. Wire rope lashings shall have a short length of long link chain to permit the length of lashings to be regulated.

(3) When timber is in lengths less than 11.8 feet the spacing of the lashings shall be reduced or other suitable provisions made to suit the length of timber.

(4) All fittings required for securing the lashings shall be of strength corresponding to the length of the lashings.

(d) *Stability.* (1) Provision shall be made for a safe margin of stability at all stages of the voyage, regard being given to additions of weight, such as those due to absorption of water and icing and to losses of weight such as those due to consumption of fuel and stores.

(e) *Protection of crew, access to machinery spaces, etc.* (1) In addition to the requirements of § 42.15-75(e) guardrails or life lines spaced not more than 13 inches apart vertically shall be provided on each side of the deck cargo to a height of at least 39½ inches above the cargo.

(f) *Steering arrangements.* (1) Steering arrangements shall be effectively protected from damage by cargo and, as far as practicable, shall be accessible. Efficient provision, shall be made for steering in the event of a breakdown in the main steering arrangements.

[CGFR 68-60, 33 FR 10067, July 12, 1968, as amended by CGFR 68-126, 34 FR 9016, June 5, 1969]

§ 42.25-20 Computation for freeboard.

(a) The minimum summer freeboards shall be computed in accordance with § 42.20-10 (a), (b), and (h) and §§ 42.20-15, 42.20-20, 42.20-25, 42.20-30, 42.20-35, 42.20-60, and 42.20-65, except that § 42.20-60 is modified by substituting the percentages in Table 42.25-20(a) for those given in § 42.20-60:

TABLE 42.25-20(a)—PERCENTAGE OF DEDUCTION FOR SUPERSTRUCTURE

[Total Effective Length of Superstructure]

	0	0.1*L*	0.2*L*	0.3*L*	0.4*L*	0.5*L*	0.6*L*	0.7*L*	0.8*L*	0.9*L*	1.0*L*
Percentage of deduction for all types of superstructure [1]	20	31	42	53	64	70	76	82	88	94	100

[1] Percentages at intermediate lengths of superstructures shall be obtained by linear interpolation.

(b) The winter timber freeboard shall be obtained by adding to the summer timber freeboard one thirty-sixth of the molded summer timber draft.

(c) The winter North Atlantic timber freeboard shall be the same as the winter North Atlantic freeboard prescribed in § 42.20-75(d)(1).

(d) The tropical timber freeboard shall be obtained by deducting from the summer timber freeboard one forty-eighth of the molded summer timber draft.

(e) The fresh water timber freeboard shall be computed in accordance with § 42.20-75(e) (1) or (2) based on the summer timber load waterline.

[CGFR 68-60, 33 FR 10067, July 12, 1968, as amended by CGFR 68-126, 34 FR 9016, June 5, 1969]

Subpart 42.30—Zones, Areas, and Seasonal Periods

§ 42.30-1 Basis.

(a) The zones and areas in this subpart are, in general, based on the following criteria:

(1) Summer: not more than 10 percent winds of force 8 Beaufort (34 knots) or more.

(2) Tropical: not more than 1 percent winds of force 8 Beaufort (34 knots) or more. Not more than one tropical storm in 10 years in an area of 5° square in any 1 separate calendar month.

(b) In certain special areas, for practical reasons, some degree of relaxation has been found acceptable.

(c) A chart is attached to the International Convention on Load Lines, 1966, which illustrates the zones and areas defined in this Convention and in this subpart.

[CGFR 68-60, 33 FR 10068, July 12, 1968, as amended by CGFR 68-126, 34 FR 9016, June 5, 1969]

§ 42.30-5 Northern Winter Seasonal Zones and area.

(a) *North Atlantic Winter Seasonal Zones I and II.* (1) The North Atlantic Winter Seasonal Zone I lies within the meridian of longitude 50° W. from the coast of Greenland to latitude 45° N.; thence the parallel of latitude 45° N. to longitude 15° W.; thence the meridian of longitude 15° W. to latitude 60° N.; thence the parallel of latitude 60° N. to the Greenwich Meridian, thence this meridian northwards.

(i) Seasonal periods:

Winter: October 16 to April 15.
Summer: April 16 to October 15.

(2) The North Atlantic Winter Seasonal Zone II lies within the meridian of longitude 68°30′ W. from the coast of the United States to latitude 40° N.; thence the rhumb line to the point latitude 36° N., longitude 73° W.; thence the parallel of latitude 36° N. to longitude 25° W.; and thence the rhumb line to Cape Torinana. Excluded from this zone are the North Atlantic Winter Seasonal Zone I and the Baltic Sea bounded by the parallel of the latitude of The Skaw in the Skagerrak.

(i) Seasonal periods:

Winter: November 1 to March 31.
Summer: April 1 to October 31.

(b) *North Atlantic Winter Seasonal Area.* (1) The boundary of the North Atlantic Winter Seasonal Area is the meridian of longitude 68°30′ W. from the coast of the United States to latitude 40° N.; thence the rhumb line to the southernmost intersection of the meridian of longitude 61° W. with the coast of Canada; and thence the east coasts of Canada and the United States.

(i) Seasonal periods:

(*a*) For vessels over 328 feet in length:

Winter: December 16 to February 15.
Summer: February 16 to December 15.

(*b*) For vessels of 328 feet and under in length:

Winter: November 1 to March 31.
Summer: April 1 to October 31.

(c) *North Pacific Winter Seasonal Zone.* The southern boundary of the North Pacific Winter Seasonal Zone is the parallel of latitude 50° N. from the east coast of the Union of Soviet Socialist Republics, to the west coast of Sakhalin; thence the west coast of Sakhalin to the southern extremity of Cape Kril'on: thence the rhumb line to Wakkanai, Hokkaido, Japan; thence the east and south coasts of Hokkaido to longitude 145° E., thence the meridian of longitude 145° E. to latitude 35° N., thence the parallel of latitude 35° N. to longitude 150° W. and thence the rhumb line to the southern extremity of Dall Island, Alaska.

(1) Seasonal periods:

Winter: October 16 to April 15.
Summer: April 16 to October 15.

[CGFR 68-60, 33 FR 10068, July 12, 1968, as amended by CGFR 68-126, 34 FR 9016, June 5, 1969]

§ 42.30-10 Southern Winter Seasonal Zone.

(a) The northern boundary of the Southern Winter Seasonal Zone is the rhumb line from the east coast of the American continent at Cape Tres Puntas to the point latitude 34° S., longitude 50° W.; thence the parallel of latitude 34° S. to longitude 17° E.; thence the rhumb line to the point latitude 35°10′ S., longitude 20° E.; thence the rhumb line to the point latitude 34° S. longitude 28° E.; thence along the rhumb line to the point latitude 35°30′ S., longitude 118° E.; thence the rhumb line to Cape Grim on the northwest coast of Tasmania; thence along the north and east coasts of Tasmania to the southernmost point of Bruny Island; thence the rhumb line to Black Rock Point on Stewart Island; thence the rhumb line to the point latitude 47° S., longitude 170° E.; thence along the rhumb line to the point latitude 33° S., longitude 170° W.; and thence the parallel of latitude 33° S. to the west coast of the American continent.

(1) Valparaiso is to be considered as being on the boundary line of the Summer and the Winter Seasonal Zones.

(2) Seasonal periods:

Winter: April 16 to October 15.
Summer: October 16 to April 15.

[CGFR 68-60, 33 FR 10068, July 12, 1968]

§ 42.30-15 Tropical Zone.

(a) *Northern boundary of the Tropical Zone.* The northern boundary of the Tropical Zone is the parallel of latitude 13° N. from the east coast of the American continent to longitude 60° W.; thence the rhumb line to a point in latitude 10° N., longitude 58° W.; thence the parallel of latitude 10° N. to longitude 20° W.; thence the meridian of longitude 20° W. to latitude 30° N.; thence the parallel of latitude 30° N. to the west coast of Africa; from the east coast of Africa the parallel of latitude 8° N. to longitude 70° E.; thence the meridian of longitude 70° E. to latitude 13° N.; thence the parallel of latitude 13° N. to the west coast of India; thence around the south coast of India to latitude 10°30′ N. on the east coast of India; thence the rhumb line to a point in latitude 9° N., longitude 82° E.; thence the meridian of longitude 82° E. to latitude 8° N.; thence the parallel of latitude 8° N. to the west coast of Malaysia; thence the coast of Southeast Asia to the east coast of Vietnam at latitude 10° N.; thence the parallel of latitude 10° N. to longitude 145° E.; thence the meridian of longitude 145° E. to latitude 13° N.; and thence the parallel of latitude 13° N. to the west coast of the American continent.

(1) Saigon is to be considered as being on the boundary line of the Tropical Zone and the Seasonal Tropical Area.

(b) *Southern boundary of the Tropical Zone.* The southern boundary of the Tropical Zone is the rhumb line from the Port of Santos, Brazil, to the point where the meridian of longitude 40° W. intersects the Tropic of Capricorn; thence the Tropic of Capricorn to the west coast of Africa; from the east coast of Africa the parallel of latitude 20° S. to the west coast of Madagascar; thence the west and north coasts of Madagascar to longitude 50° E.; thence the meridian of longitude 50° E. to latitude 10° S.; thence the parallel of latitude 10° S. to longitude 98° E.; thence the rhumb line to Port Darwin, Australia; thence the coasts of Australia and Wessel Island eastwards to Cape Wessel; thence the parallel of latitude 11° S. to the west side of Cape York; from the east side of Cape York the parallel of latitude 11° S. to longitude 150° W.; thence the rhumb line to the point latitude 26° S., longitude 75° W.; and thence the rhumb line to the west coast of the American continent at latitude 30° S.

(1) Coquimbo and Santos are to be considered as being on the boundary line of the Tropical and Summer Zones.

(c) *Areas to be included in the Tropical Zone.* The following areas are to be treated as included in the Tropical Zone:

(1) The Suez Canal, the Red Sea, and the Gulf of Aden, from Port Said to the meridian of longitude 45° E.

(i) Aden and Berbera are to be considered as being on the boundary line of the Tropical Zone and the Seasonal Tropical Area.

(2) The Persian Gulf of the meridian of longitude 59° E.

(3) The area bounded by the parallel of latitude 22° S. from the east coast of Australia to the Great Barrier Reef, thence the Great Barrier Reef to latitude 11° S. The northern boundary of the area is the southern boundary of the Tropical Zone.

[CGFR 68-60, 33 FR 10068, July 12, 1968]

§ 42.30–20 Seasonal Tropical Areas.

The following are Seasonal Tropical Areas:

(a) *In the North Atlantic.* It is an area bounded on the north by the rhumb line from Cape Catoche, Yucatan, to Cape San Antonio, Cuba, the north coast of Cuba to latitude 20° N., thence the parallel of latitude 20° N. to longitude 20° W.; on the west by the coast of the American continent; on the south and east by the northern boundary of the Tropical Zone.

(1) Seasonal periods:

Tropical: November 1 to July 15.
Summer: July 16 to October 31.

(b) *In the Arabian Sea.* An area bounded on the west by the coast of Africa, the meridian of longitude 45° E. in the Gulf of Aden, the coast of South Arabia and the meridian of longitude 59° E. in the Gulf of Oman; on the north and east by the coasts of Pakistan and India; on the south by the northern boundary of the Tropical Zone.

(1) Seasonal periods:

Tropical: September 1 to May 31.
Summer: June 1 to August 31.

(c) *In the Bay of Bengal.* The Bay of Bengal north of the northern boundary of the Tropical Zone.

(1) Seasonal periods:

Tropical: December 1 to April 30.
Summer: May 1 to November 30.

(d) *In the South Indian Ocean.* (1) An area bounded on the north and west by the southern boundary of the Tropical Zone and the east coast of Madagascar; on the south by the parallel of latitude 20° S.; on the east by the rhumb line from a point in latitude 20° S., longitude 50° E., to a point in latitude 15° S., longitude 51°30′ E., and thence by the meridian of longitude 51°30′ E. to latitude 10° S.

(i) Seasonal periods:

Tropical: April 1 to November 30.
Summer: December 1 to March 31.

(2) An area bounded on the north by the southern boundary of the Tropical Zone; on the east by the coast of Australia; on the south by the parallel of latitude 15° S. from longitude 51°30′ E., to longitude 120° E. and thence the meridian of longitude 120° E. to the coast of Australia; on the west by the meridian of longitude 51°30′ E.

(i) Seasonal periods:

Tropical: May 1 to November 30.
Summer: December 1 to April 30.

(e) *In the China Sea.* An area bounded on the west and north by the coasts of Vietnam and China from latitude 10° N. to Hong Kong; on the east by the rhumb line from Hong Kong to the Port of Sual (Luzon Island), and the west coasts of the Islands of Luzon, Samar, and Leyte to latitude 10° N.; on the south by the parallel of latitude 10° N.

(1) Hong Kong and Sual are to be considered as being on the boundary of the Seasonal Tropical Area and Summer Zone.

(2) Seasonal periods:

Tropical: January 21 to April 30.
Summer: May 1 to January 20.

(f) *In the North Pacific.* (1) An area bounded on the north by the parallel of latitude 25° N.; on the west by the meridian of longitude 160° E.; on the south by the parallel of latitude 13° N.; on the east by the meridian of longitude 130° W.

(i) Seasonal periods:

Tropical: April 1 to October 31.
Summer: November 1 to March 31.

(2) An area bounded on the north and east by the west coast of the American continent; on the west by the meridian of longitude 123° W. from the coast of the American continent to latitude 33° N., longitude 123° W.; to the point latitude 13° N., longitude 105° W.; on the south by the parallel of latitude 13° N.

(i) Seasonal periods:

Tropical: March 1 to June 30, and November 1 to November 30.
Summer: July 1 to October 31, and December 1 to February 28/29.

(g) *In the South Pacific.* (1) The Gulf of Carpentaria south of latitude 11° S.

(i) Seasonal periods:

Tropical: April 1 to November 30.
Summer: December 1 to March 31.

(2) An area bounded on the north and east by the southern boundary of the Tropical Zone; on the south by the Tropic of Capricorn from the east coast of Australia to longitude 150° W.; thence by the meridian of longitude 150° W. to latitude 20° S. and thence by the parallel of latitude 20° S. to the point where it intersects the southern boundary of the Tropical Zone; on the west by the boundaries of the area within the Great Barrier Reef included in the Tropical Zone, and by the east coast of Australia.

(i) Seasonal periods:

Tropical: April 1 to November 30.
Summer: December 1 to March 31.

[CGFR 68-60, 33 FR 10068, July 12, 1968, as amended by CGFR 68-126, 34 FR 9016, June 5, 1969]

§ 42.30-25 Summer Zones.

(a) The remaining areas constitute the Summer Zones.

(1) However, for vessels of 328 feet and under in length, the area bounded on the north and west by the east coast of the United States; on the east by the meridian of longitude 68°30′ W. from the coast of the United States to latitude 40° N. and thence by the rhumb line to the point latitude 36° N., longitude 73° W.; on the south by the parallel of latitude 36° N.; is a Winter Seasonal Area.

(i) Seasonal periods:

Winter: November 1 to March 31.
Summer: April 1 to October 31.

[CGFR 68-60, 33 FR 10069, July 12, 1968, as amended by CGFR 68-126, 34 FR 9016, June 5, 1969]

§ 42.30-30 Enclosed seas.

(a) *Baltic Sea.* This sea bounded by the parallel of latitude of The Skaw in the Skagerrak is included in the Summer Zones.

(1) However, for vessels of 328 feet and under in length, it is a Winter Seasonal Area.

(i) Seasonal periods:

Winter: November 1 to March 31.
Summer: April 1 to October 31.

(b) *Black Sea.* This sea is included in the Summer Zones.

(1) However, for vessels of 328 feet and under in length, the area north of latitude 44° N. is a Winter Seasonal Area.

(i) Seasonal periods:

Winter: December 1 to February 28/29.
Summer: March 1 to November 30.

(c) *Mediterranean.* This sea is included in the Summer Zones.

(1) However, for vessels of 328 feet and under in length, the area bounded on the north and west by the coasts of France and Spain and the meridian of longitude 3° E. from the coast of Spain to latitude 40° N.; on the south by the parallel of latitude 40° N. from longitude 3° E. to the west coast of Sardinia; on the east by the west and north coasts of Sardinia from latitude 40° N. to longitude 9° E., thence by the meridian of longitude 9° E. to the south coast of Corsica, thence by the west and north coasts of Corsica to longitude 9° E. and thence by the rhumb line to Cape Sicie; is a Winter Seasonal Area.

(i) Seasonal periods:

Winter: December 16 to March 15.
Summer: March 16 to December 15.

(d) *Sea of Japan.* This sea south of the parallel of latitude 50° N. is included in the Summer Zones.

(1) However, for vessels of 382 feet and under in length, the area between the parallel of latitude 50° N. and the rhumb line from the east coast of Korea at latitude 38° N. to the west coast of Hokkaido, Japan, at latitude 43°12′ N., is a Winter Seasonal Area.

(i) Seasonal periods:

Winter: December 1 to February 28/29.
Summer: March 1 to November 30.

[CGFR 68-60, 33 FR 10069, July 12, 1968, as amended by CGFR 68-126, 34 FR 9016, June 5, 1969]

§ 42.30-35 The Winter North Atlantic Load Line.

(a) The part of the North Atlantic referred to in § 42.20-75(d)(1) comprises:

(1) That part of the North Atlantic Winter Seasonal Zone II which lies between the meridians of 15° W. and 50° W.; and

(2) The whole of the North Atlantic Winter Seasonal Zone I, the Shetland Islands to be considered as being on the boundary.

[CGFR 68-60, 33 FR 10069, July 12, 1968]

Subpart 42.35—Load Line Assignment and Surveys; Fees and Other Expenses

§ 42.35-1 Scale of fees.

(a) Subject to the conditions as set forth in this section, fees payable by owners will be charged for assignment of load line (including load line and condition survey, verification of markings and issuance of load line certificates) in accordance with Table 42.35-1.

TABLE 42.35-1.—FEES FOR ASSIGNMENT OF LOAD LINE

Fee numeral [1] or gross tonnage	Fee classed vessels	Fee unclassed vessels
Under 200	$35	$170
200 and under 400	35	220
400 and under 700	40	265
700 and under 1,000	45	325
1,000 and under 1,500	45	400
1,500 and under 2,500	55	465
2,500 and under 3,500	70	535
3,500 and under 5,000	80	605
5,000 and under 6,500	100	675
6,500 and under 8,000	115	740
8,000 and under 10,000	125	810
10,000 and under 12,000	140	880
12,000 and under 15,000	150	950
15,000 and above	160	1,020

[1] Fee numeral is equal to $(L \times B \times D)/140$ in which *L*, *B*, and *D* are the molded dimensions. The fee numeral shall be used when it is greater than the gross tonnage.

(b) In the case of unclassed vessels newly built, where an extensive review of construction plans and attendance during construction by the Surveyors of the assigning authority may be required; in the case of existing unclassed vessels where necessary plans are not available; and in cases where alterations or repairs are made, which would require more than a normal attendance by the Surveyors; additional fees, proportional to the amount of work involved, may be charged.

(c) The provisions of this section including additional fees, as applicable, may be applied to either classed or unclassed vessels in the following cases:

(1) Where due to alterations or changes in service, a new freeboard may be required; or

(2) Where freeboard assignment is based upon additional work associated with damage stability or flooding data preparation or review by the assigning authority.

(d) For full strength or subdivision load line calculations, a fee commensurate with the amount of work involved will be charged with $125 as a minimum fee.

(R.S. 4405, as amended, 4462, as amended, 46 U.S.C. 86, 375, 416; 49 CFR 1.4(b))

[CGFR 68-60, 33 FR 10069, July 12, 1968, as amended by CGFR 68-126, 34 FR 9016, June 5, 1969; CGFR 69-72, 34 FR 17482, Oct. 29, 1969; CGD 75-139, 40 FR 57218, Dec. 8, 1975]

§ 42.35-5 Fees for reissue of load line certificates.

(a) For unclassed vessels the fee for periodical condition survey and reissue of Load Line Certificate shall be 75 percent of the scale in § 42.35-1. In cases where alterations or repairs are made which would require more than a normal attendance by the Surveyors, additional fees, proportional to the amount of work involved, may be charged.

(b) For classed vessels where the survey is carried out in conjunction with a survey required for maintenance of class and for which a fee is chargeable, no charge will be made for the survey, but an amount not exceeding $25 for the issuance of the new load line certificate may be charged.

(c) The minimum charge for the reissuance of load line certificates, such as for a change of flag or short term extension, shall be $70. This assumes one visit equivalent to an annual load line inspection.

(R.S. 4405, as amended, 4462, as amended; 46 U.S.C. 86, 375, 416; 49 CFR 1.4(b))

[CGFR 68–60, 33 FR 10070, July 12, 1968, as amended by CGFR 68–126, 34 FR 9017, June 5, 1969; CGFR 69–72, 34 FR 17482, Oct. 29, 1969; CGD 75–139, 40 FR 57218, Dec. 8, 1975]

§ 42.35–10 Fees for annual load line survey.

(a) The fee for annual load line survey shall be $65 for vessels not exceeding 2,000 gross tons, and $70 for vessels of more than 2,000 gross tons. Where alterations or repairs are made, which would require more than a normal attendance by the Surveyors, additional fees, proportional to the work involved, may be charged.

(b) In the case of a classed vessel, no charge will be made for this survey if carried out at the same time as a survey to the hull that is required for maintenance of class and for which a fee is chargeable.

(R.S. 4405, as amended, 4462, as amended; 46 U.S.C. 86, 375, 416; 49 CFR 1.4(b))

[CGFR 68–60, 33 FR 10070, July 12, 1968, as amended by CGFR 68–126, 34 FR 9017, June 5, 1969; CGFR 69–72, 34 FR 17482, Oct. 29, 1969; CGD 75–139, 40 FR 57218, Dec. 8, 1975]

§ 42.35–15 Traveling expenses.

(a) For all traveling expenses incurred in connection with the surveys described in this section there will be an additional charge.

[CGFR 68–60, 33 FR 10070, July 12, 1968]

Subpart 42.50—Load Line Certificates—Model Forms

§ 42.50–1 General.

(a) The provisions of this subpart set forth the requirements for the text of the various load line certificates issued to vessels complying with the applicable requirements in this Part. See §§ 42.07–35 and 42.07–40 for requirements regarding load line assigning and issuing authorities. See § 42.07–45 for requirements regarding load line certificates, their text and arrangement.

(b) The 1966 international load line certificate and exemption certificate shall be the same as set forth in this subpart in the model Forms A1, A2, A3, and E1, except for the following authorized variations which shall also apply to model Forms B, C1, C2, and C3:

(1) As indicated in § 42.13–30, the freeboards and load line marks which are not applicable to a specific vessel need not be entered on the certificate issued.

(2) The provisions of Note 3 on the front of the certificate forms (other than Model E1) may be changed to correctly describe the situation applicable to the vessel concerning information and instructions furnished the master about loading and ballasting the vessel to provide a guide as to stability under various conditions and as to avoid unacceptable stresses in the vessel's structure.

(c) In the load line certificate the assigning and issuing authority shall set forth its full official designation; i.e., its legal name, address of home office, and reference to the authorization from the Commandant where an assigning and issuing authority other than the American Bureau of Shipping is designated.

[CGFR 68–126, 34 FR 9017, June 5, 1969]

§ 42.50–5 International load line certificates.

(a) The various forms of certificates certifying to the correctness of the load line marks assigned under the regulations in this subchapter and/or certain exemptions therefrom for U.S.-flag vessels engaged in foreign voyages, or engaged in coastwise or intercoastal voyages (provided such vessels qualify to engage in foreign voyages without restriction), are A1, A2, A3, and E1. The detailed application of these forms is as specified in § 42.07–45 (e), (f), and (h).

(b) The text and arrangement of the printed portions of Form *A1* (printed front and back) are as follows:

INTERNATIONAL LOAD LINE CERTIFICATE (1966)

[Form *A1*]

(Official seal of issuing authority.)

(Certificate No. ———)

Issued under the provisions of the International Convention on Load Lines, 1966, under the authority of the Government of the United States of America, and the Commandant, U.S. Coast Guard:

By ....

(Insert full official designation of issuing authority)

and duly authorized for assigning purposes under the provisions of the Convention.

Name of ship	Official number or distinctive letters	Port of registry	Length (*L*) as defined in Article 2(8) i.e., 46 CFR 42.13–15

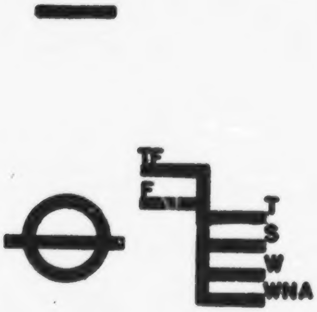
Freeboard assigned as: [1] { A new ship .... An existing ship ....

Type of ship: [1] { Type "A". Type "B". Type "B" with reduced freeboard. Type "B" with increased freeboard.

FREEBOARD FROM DECK LINE		LOAD LINE	
Tropical	———(inches)	(T)	———(inches) above (S).
Summer	———(inches)	(S)	Upper edge of line at level of center of ring.
Winter	———(inches)	(W)	———(inches) below (S).
Winter (North Atlantic)	———(inches)	(WNA)	———(inches) below (S).
Allowance for fresh water for all freeboards			———(inches).

(All measurements are to upper edge of the respective horizontal lines)

The upper edge of the deck line from which these freeboards are measured is ——— inches above or below the top of the ——— deck at side; i.e., freeboard [1] deck.



This is to certify that this ship has been surveyed and that the freeboards have been assigned and load lines shown above have been marked in accordance with the International Convention on Load Lines, 1966.

This certificate is valid until ————,[2] subject to annual surveys in accordance with Article 14(1)(c) of the Convention, and endorsement thereof on the reverse side of the certificate.

Issued at ———— (Place of issue of certificate), ———, 19— (Date of issue)

(Signature of official issuing the certificate)

[Seal of issuing authority]

The undersigned declares that he is duly authorized by the said Government to issue this certificate.

(Signature)

NOTES

1. When a ship departs from a port situated on a river or inland waters, deeper loading shall be permitted corresponding to the weight of fuel and all other materials required for consumption between the point of departure and the sea.

2. When a ship is in fresh water of unit density, the appropriate load line may be submerged by the amount of the fresh water allowance shown above. Where the density is other than unity, an allowance shall be made proportional to the difference between 1.025 and the actual density.

3. It is the owner's responsibility to furnish the master with information and instructions for loading and ballasting this vessel to provide guidance as to stability of the vessel under varying conditions of service and to avoid unacceptable stresses in the vessel's structure.

[1] The issuing authority is authorized to delete or change words whenever it is inapplicable to a specific vessel and to arrange wording so appropriate word insertions may be made, which accurately describe the facts.

[2] At the expiration of this certificate, applicable reissuance should be obtained in accordance with the Load Line Regulations.

(REVERSE SIDE OF CERTIFICATE)

ANNUAL SURVEYS

This is to certify that at an annual survey required by Article 14(1)(c) of the Convention, this ship was found to comply with the relevant provisions of the Convention.

Place .... Date ....

....

(Signature and seal of issuing authority)

Place .... Date ....

....

(Signature and seal of issuing authority)

Place .... Date ....

....

(Signature and seal of issuing authority)

Place .... Date ....

....

(Signature and seal of issuing authority)

EXTENSION OF LOAD LINE CERTIFICATE

The provisions of the Convention being fully complied with by this ship, the validity of this certificate is, in accordance with Article 19(2) of the Convention, extended until.

Place .... Date ....

....

(Signature and seal of issuing authority)

NOTES

4. The Winter North Atlantic Load Line applies only to vessels of 328 feet in length or less, which enter any part of the North Atlantic Ocean during the winter months as defined by the Load Line Regulations in 46 CFR 42.30-5 and 42.30-35. The periods during which the other seasonal load lines apply in different parts of the world are as stated in the Load Line Regulations in 46 CFR 42.30-5 to 42.30-30, inclusive.

5. The Load Line Certificate will be canceled by the Commandant, U.S. Coast Guard, if:

(a) The annual surveys have not been carried out within 3 months either way of each anniversary of the certificate date.

(b) The certificate is not endorsed to show that the ship has been surveyed as indicated in (a).

(c) Material alterations have been made to the hull or superstructure of the vessel, such as would necessitate the assignment of an increased freeboard.

(d) The fittings and appliances for the protection of the openings, guardrails, freeing ports, or the means of access to the crew's quarters have not been maintained in as effective a condition as they were when the certificate was issued.

(e) The structural strength of the ship is lowered to such an extent that the ship is unsafe.

6. When this certificate has expired or has been canceled, it must be delivered to the issuing authority.

(c) The text and arrangement of the printed portion of Form *A2* shall be identical with the information on the face and reverse sides of Form *A1* certificate in paragraph (b) of this section except for the identification of model form, description of the "Freeboard from deck line," the "Load Line," and the illustration of load line marks, which shall be as follows:

INTERNATIONAL LOAD LINE CERTIFICATE (1966)

[Form *A2*]

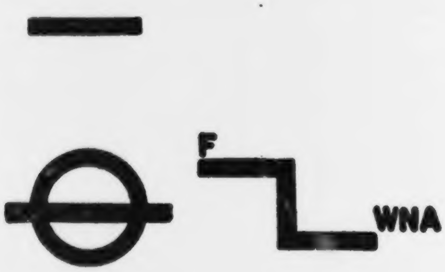
* * * * * * *

	FREEBOARD FROM DECK LINE		LOAD LINE
Tropical Summer Winter	—— (inches)		Upper edge of line at level of center of ring.
Winter—North Atlantic	—— (inches)	(WNA)	Upper edge of line —— (inches) below upper edge at level of center of ring.

Allowance for fresh water for all freeboards —— (inches).

(All measurements are to upper edge of the respective horizontal lines)

The upper edge of the deck line from which these freeboards are measured is —— inches above or below the top of the ———— deck at side; i.e., freeboard[1] deck.



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[1] The issuing authority is authorized to delete or change words whenever it is inapplicable to a specific vessel and to arrange wording so appropriate word insertions may be made, which accurately describe the facts.

(d) The text and arrangement of the printed portion of Form *A3* shall be identical with the information on the face and reverse sides of Form *A1* certificate in paragraph (b) of this section except for the identification of model form, description of the "Freeboard from deck line," the "Load Line," and the illustration of load line marks, which shall be as follows:

INTERNATIONAL LOAD LINE CERTIFICATE (1966)

[Form *A3*]

* * * * * * *

The timber freeboards given in this certificate are applicable only when this ship carries a timber deck cargo and complies with special requirements of the Load Line Regulations regarding timber deck cargoes.

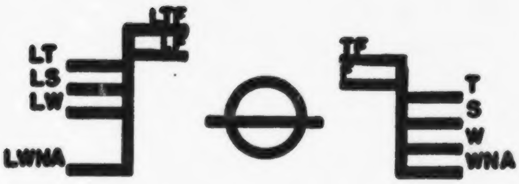
	FREEBOARD FROM DECK LINE		LOAD LINE
Tropical	——(inches)	(T)	——(inches) above (S).
Summer	——(inches)	(S)	Upper edge of line at level of center of ring.
Winter	——(inches)	(W)	——(inches) below (S).
Winter—North Atlantic	——(inches)	(WNA)	——(inches) below (S)
Timber—tropical	——(inches)	(LT)	——(inches) above (LS).
Timber—summer	——(inches)	(LS)	——(inches) above (S).
Timber—winter	——(inches)	(LW)	——(inches) below (LS).
Timber—winter—North Atlantic.	——(inches)	(LWNA)	——(inches) below (LS).

Allowance for fresh water for all freeboards other than timber ——(inches).

Allowance for fresh water for all timber freeboards ——(inches).

(All measurements are to upper edge of the respective horizontal lines)

The upper edge of the deck line from which these freeboards are measured is —— inches above or below the top of the ———— deck at side; i.e., freeboard[1] deck.



* * * * * * *

[1] The issuing authority is authorized to delete or change words whenever it is inapplicable to a specific vessel and to arrange wording so appropriate word insertions may be made, which accurately describe the facts.

(e) The text and arrangement of the printed portions of Form E1 are as follows:

INTERNATIONAL LOAD LINE EXEMPTION CERTIFICATE

[Form *E1*]

(Official seal of issuing authority.)
(Certificate No. ——)

Issued under the provisions of the International Convention on Load Lines, 1966, under the authority of the Government of the United States of America, and the Commandant U.S. Coast Guard:

By ....

(Insert full official designation of issuing authority)

....

and duly authorized for assigning and exemption purposes under the provisions of the Convention.

Name of ship	Official numbers of distinctive letters	Port of registry

This is to certify that the above-mentioned ship is exempted from the provisions of the 1966 Convention, under the authority conferred by Article 6(2),[1] Article 6(4),[1] of the Convention referred to above and that this ship has been surveyed accordingly.

The provisions of the Convention from which the ship is exempted under Article 6(2) are:

....

....

The voyage for which exemption is granted under Article 6(4) is:

From:..

To: ....

Conditions, if any, on which the exemption is granted under either Article 6(2) or Article 6(4):

....

....

This certificate is valid until ——————,[2] subject, where appropriate, to annual surveys in accordance with Article 14(1)(c) of the Convention, and endorsement thereof on the reverse side of the certificate.

Issued at

(Place of issue of certificate)

(Date of issue).

....

(Signature of official issuing the certificate)

[Seal of issuing authority]

The undersigned declares that he is duly authorized by the said Government to issue this certificate.

(Signature)

[1] The issuing authority is authorized to delete whichever reference is inapplicable.

[2] At the expiration of this certificate, applicable reissuance should be obtained in accordance with the Load Line Regulations, if permitted.

(Reverse side of exemption certificate)

ANNUAL SURVEYS

This is to certify that this ship continues to comply with the conditions under which this exemption was granted.

Place .... Date ....

....

(Signature and seal of issuing authority)

Place .... Date ....

....

(Signature and seal of issuing authority)

Place .... Date ....

....

(Signature and seal of issuing authority)

Place .... Date ....

....

(Signature and seal of issuing authority)

EXTENSION OF LOAD LINE CERTIFICATE

This ship continues to comply with the conditions under which this exemption was granted and the validity of this certificate is, in accordance with Article 19(4)(a) of the Convention, extended until.

Place .... Date ....

....

(Signature and seal of issuing authority)

[CGFR 68-60, 33 FR 10070, July 12, 1968, as amended by CGFR 68-126, 34 FR 9017, June 5, 1969]

§ 42.50-10 Load line certificates for nonadherent foreign flag vessels.

(a) The form of load line certificate certifying to the correctness of the load line marks assigned under the regulations in this subchapter to nonadherent foreign flag vessels as specified in § 42.07-45(e)(2) is:

(1) Form B for general use. The period of validity shall be as expressed in § 42.09-20(c).

(b) The text and arrangement of the printed portion of Form B shall be identical with the information on the face and reverse sides of Form A1 certificate in § 42.50-5(b) except for title of certificate, model form, the first paragraph, and the wording of the certificate for issuance and revalidation, which shall be as follows:

LOAD LINE CERTIFICATE

(Form *B*)

(Official seal of issuing authority.)
(Certificate No. ——)

Issued under the authority of the Commandant, U.S. Coast Guard, United States of America, under the provisions of the Load Line Act of March 2, 1929, as amended (46 U.S.C. 85-85g), and the Load Line Regulations in 46 CFR Part 42:
By ....

(Insert full official designation of issuing authority)

and duly authorized for assigning purposes under the provisions of the Load Line Act of March 2, 1929, as amended.

* * * * * * *

This is to certify that this ship has been surveyed and the freeboards have been assigned and load lines shown above have been marked upon the vessel in manner and location as required by the Load Line Regulations of the Commandant, U.S. Coast Guard, in 46 CFR Part 42.

This certificate remains in force until ————,[3] subject to annual revalidation in accordance with the Load Line Regulations, and endorsement thereof on the reverse side of this certificate.

Issued at ———— (Place of issue of certificate), ————, 19— (Date of issue)

(Signature of official issuing the certificate)
[Seal of issuing authority]

* * * * * * *

[3] Expiration date is not to exceed 5 years from original date of issue of this certificate. At expiration applicable reissuance of this certificate should be obtained in accordance with the Load Line Regulations.

* * * * * * *

(Reverse Side of Certificate)

ANNUAL REVALIDATION OF CERTIFICATE

This is to certify that the provisions of the Load Line Regulations of the Commandant, U.S. Coast Guard, are fully complied with by the condition of this ship on the dates indicated, and in each case this certificate is revalidated for a 1 year interval as follows:

(1) Until ....
Place.......................... Date..........................
....
(Signature and seal of issuing authority)

(1) Until ....
Place.......................... Date..........................
....
(Signature and seal of issuing authority)

(1) Until ....
Place.......................... Date..........................
....
(Signature and seal of issuing authority)

(1) Until ....
Place.......................... Date..........................
....
(Signature and seal of issuing authority)

[CGFR 68-126, 34 FR 9017, June 5, 1969]

§ 42.50-15 Coastwise load line certificates for U.S.-flag vessels.

(a) The forms of the coastwise load line certificate, other than for special service which are provided for in Part 44 of this subchapter, certifying to the correctness of the load line marks assigned under the regulations in this part are C1, C2 and C3. The detailed application of these forms is as specified in § 42.07-45(e).

(b) Space shall be provided on the face of each of the coastwise load line certificates so that there may be entered thereon a record of the restrictions applicable to the vessel, if any.

(c) The text and arrangement of the printed portions of Form *C1* are as follows:

COASTWISE LOAD LINE CERTIFICATE

[Form *C1*]

(Official seal of issuing authority.)
(Certificate No. ——)

Issued under the authority of the Commandant, U.S. Coast Guard, under the provisions of the Coastwise Load Line Act, 1935, as amended (46 U.S.C. 88–88g), and the Load Line Regulations in 46 CFR Part 42:

By ....

(Insert full official designation of issuing authority)

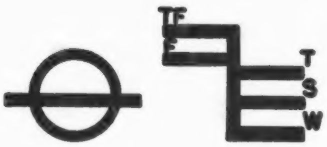
....

and duly authorized for assigning purposes under the provisions of this law for vessels engaging in coastwise and/or intercoastal voyages.

Name of ship	Official number or distinctive letters	Port or registry	Length (L) as defined in 46 CFR 42.13–15
Freeboard assigned as: [1]	A new ship. An existing ship.	Type of ship: [1]	Type "A". Type "B". Type "B" with reduced freeboard. Type "B" with increased freeboard.
		FREEBOARD FROM DECK LINE	LOAD LINE
Tropical	——(inches)	(T)	——(inches) above (S).
Summer	——(inches)	(S)	——Upper edge of line at level of center of ring.
Winter	——(inches)	(W)	——(inches) below (S).
Allowance for fresh water for all freeboards			——(inches)

(All measurements are to upper edge of the respective horizontal lines)

The upper edge of the deck line from which these freeboards are measured is —— inches above or below the top of the ———— deck at side; i.e., freeboard [1] deck.



* * * * * * *

Date of initial or periodical survey ....

The following is a record of the restrictions applicable to the above named ship:

....

(List restrictions. If none, insert "None.")

....

This is to certify that this ship has been surveyed and that the freeboards have been assigned and load lines shown above have been marked in accordance with the Commandant, U.S. Coast Guard, Coastwise Load Line Regulations in 46 CFR Parts 42 to 46, inclusive as applicable.

This certificate remains in force until ————,[2] subject to annual surveys in accordance with applicable Load Line Regulations, and endorsement thereof on the reverse side of the certificate.

Issued at

....

(Place of issue of certificate) (Date of issue)

By

....

(Signature of official issuing the certificate)

[Seal of issuing authority]

NOTES

1. When a ship departs from a port situated on a river or inland waters, deeper loading shall be permitted corresponding to the weight of fuel and all other materials required for consumption between the point of departure and the sea.

2. When a ship is in fresh water of unit density the appropriate load line may be submerged by the amount of the fresh water allowance shown above. Where the density is other than unity, an allowance shall be made proportional to the difference between 1.025 and the actual density.

3. It is the owner's responsibility to furnish the master with information and instructions for loading and ballasting this vessel to provide guidance as to stability of the vessel under varying conditions of service and to avoid unacceptable stresses in the vessel's structure.

[1] The issuing authority is authorized to delete or change words inapplicable to a specific vessel and to arrange wording so appropriate word insertions may be made, which accurately describe the facts.

[2] At the expiration of this certificate, applicable reissuance should be obtained in accordance with the Load Line Regulations.

(Reverse side of Coastwise Load Line Certificate)

ANNUAL SURVEYS

This is to certify that this ship has been surveyed on the dates indicated to determine in each case whether this certificate should remain in force for an additional 1 year and the survey has been completed to my satisfaction.

(1)	.... Signature of Surveyor	.... Place	.... Date
(2)	.... Signature of Surveyor	.... Place	.... Date
(3)	.... Signature of Surveyor	.... Place	.... Date
(4)	.... Signature of Surveyor	.... Place	.... Date

EXTENSION OF LOAD LINE CERTIFICATE

The provisions of the Coastwise Load Line Regulations of the Commandant, U.S. Coast Guard, being fully complied with by this ship, this certificate is extended under the authority of 46 CFR 42.07–45 and 42.09–15 until.

Place .... Date..............................

....

(Name of issuing authority and signature of Surveyor)

NOTES

4. The periods and areas during which the seasonal load lines apply are as stated in the Load Line Regulations in 46 CFR Subpart 42.30, as appropriate.

5. This Coastwise Load Line Certificate will be canceled by the Commandant, U.S. Coast Guard, if:

(a) The annual surveys have not been carried out within three months either way of each anniversary of the certificate date.

(b) The certificate is not endorsed to show that the ship has been surveyed as indicated in (a).

(c) Material alterations have been made to the hull or superstructure of the vessel, such as would necessitate the assignment of an increased freeboard.

(d) The fittings and appliances for the protection of the openings, guardrails, freeing ports, or the means of access to the crew's quarters have not been maintained in as effective a condition as they were when the certificate was issued.

(e) The structural strength of the ship is lowered to such an extent that the ship is unsafe.

6. When this certificate has expired or has been canceled, it must be delivered to the issuing authority.

* * * * * * *

(d) The text and arrangement of the printed portion of Form *C2* shall be identical with the information on the face and revese sides of Form *C1* certificate in paragraph (c) of this section except for the identification of model form, description of the "Freeboard from deck line", the "Load Line", and the illustration of load line marks, which shall be as follows:

COASTWISE LOAD LINE CERTIFICATE

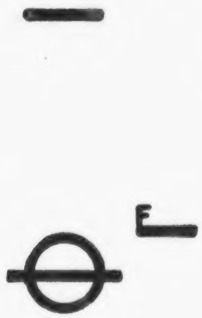
[Form *C2*]

* * * * * * *

	FREEBOARD FROM DECK LINE	LOAD LINE
Tropical	———(inches)	Upper edge of line at level center of ring.
Summer	do	of ring.
Winter	do	Do.
Allowance for fresh water for all freeboards		———(inches).

(All measurements are to upper edge of the respective horizontal lines)

The upper edge of the deck line from which these freeboards are measured is ——— inches above or below the top of the ————— deck at side; i.e., freeboard[1] deck.



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(e) The text and arrangement of the printed portion of Form *C3* shall be identical with the information on the face and reverse sides of Form *C1* certificate in paragraph (c) of this section except for the identification of model form, description of the "Freeboard from deck line," the "Load Line," and the illustration of load line marks, which shall be as follows:

COASTWISE LOAD LINE CERTIFICATE

[Form *C3*]

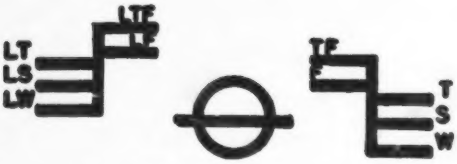
* * * * * * *

The timber freeboards given in this certificate are applicable only when this ship carries a timber deck cargo and complies with the special requirements of the Load Line Regulations regarding timber deck cargoes.

	FREEBOARD FROM DECK LINE LOAD LINE		LOAD LINE
Tropical	———(inches)	(T)	———(inches) above (S).
Summer	———(inches)	(S)	Upper edge of line at level of center of ring.
Winter	———(inches)	(W)	———(inches) below (S).
Timber—tropical	———(inches)	(LT)	———(inches) above (LS).
Timber—summer	———(inches)	(LS)	———(inches) above (S).
Timber—winter	———(inches)	(LW)	———(inches) below (LS).
Allowance for fresh water for all freeboards other than timber			———(inches).
Allowance for fresh water for all timber freeboards			———(inches).

(All measurements are to upper edge of the respective horizontal lines)

The upper edge of the deck line from which these freeboards are measured is ——— inches above or below the top of the ————— deck at side; i.e., freeboard[1] deck.



* * * * * * *

[1] The issuing authority is authorized to delete or change words inapplicable to a specific vessel and to arrange wording so appropriate word insertions may be made, which accurately describe the facts.

[CGFR 68-60, 33 FR 10073, July 12, 1968, as amended by CGFR 68-126, 34 FR 9018, June 5, 1969]

PART 43—FOREIGN OR COASTWISE VOYAGES BY EXISTING MERCHANT VESSELS

Subpart 43.01—Administration

Sec.
43.01-1 Establishment of load lines.
43.01-15 Timber cargoes.
43.01-20 Tankers.
43.01-25 New and existing vessels.
43.01-30 Vessels of special types.
43.01-32 Stability.
43.01-35 Marks to indicate load lines.
43.01-40 Assignment and certification; assigning authority.
43.01-50 Surveys.
43.01-55 Annual inspection.
43.01-60 Application for assignment, surveys, and certification.
43.01-65 Application for annual inspection.
43.01-70 Equivalents.
43.01-75 Validity and reissue of certificates.
43.01-85 Cancellation of certificate.
43.01-90 Zones and seasonal areas.
43.01-95 Logbook entries.
43.01-97 Control.
43.01-100 Approval of the Commandant, U.S. Coast Guard.

Subpart 43.05—General Rules for Determining Maximum Load Lines of Merchant Vessels

43.05-1 Definitions.
43.05-5 Deck line.
43.05-10 Load line disk.
43.05-15 Lines used with disk.
43.05-20 Mark of assigning authority.
43.05-25 Details of marking.
43.05-30 Verification of marks.

Subpart 43.10—Conditions of Assignment of Load Lines

43.10-1 Construction of vessel.
43.10-5 Cargo and other hatchways not protected by superstructures.
43.10-10 Hatchway coamings.
Sec.
43.10-15 Hatchway covers.
43.10-20 Hatchway beams and fore-and-afters.
43.10-25 Carriers or sockets.
43.10-30 Cleats.
43.10-35 Battens and wedges.
43.10-40 Tarpaulins.
43.10-45 Security of hatchway covers.
43.10-50 Cargo and other hatchways in the freeboard deck within superstructures which are fitted with closing appliances less efficient than class 1.
43.10-55 Hatchway coamings and closing arrangements.
43.10-60 Machinery space openings in exposed positions on freeboard and raised quarter-decks.
43.10-65 Machinery space openings in exposed positions on superstructure decks other than raised quarter-decks.
43.10-67 Machinery space openings in the freeboard deck within superstructures which are fitted with closing appliances less efficient than class 1.
43.10-70 Flush bunker scuttles.
43.10-75 Companionways.
43.10-77 Ventilators in exposed positions on freeboard and superstructure decks.
43.10-80 Air pipes.
43.10-85 Gangway, cargo, and coaling ports.
43.10-87 Scuppers and sanitary discharge pipes.
43.10-90 Air ports.
43.10-95 Guardrails.
43.10-97 Freeing ports.
43.10-100 Protection of crew.

Subpart 43.15—Load Lines for Steamers

43.15-1 Length (L).
43.15-5 Breadth (B).
43.15-7 Molded depth.
43.15-10 Depth for freeboard (D).
43.15-15 Coefficient of fineness (c).
43.15-17 Strength.
43.15-20 Height of superstructure.

Sec.
43.15-25 Standard height of superstructure.
43.15-27 Length of superstructure (S).
43.15-30 Enclosed superstructure.
43.15-35 Superstructure bulkheads.
43.15-37 Class 1 closing appliances.
43.15-40 Class 2 closing appliances.
43.15-43 Temporary closing appliances.
43.15-45 General, relative superstructures.
43.15-47 Poop.
43.15-50 Raised quarter-deck.
43.15-53 Bridge.
43.15-55 Forecastle.
43.15-57 Trunk.
43.15-60 Enclosed superstructure with middle line openings in the deck not provided with permanent means of closing.
43.15-63 Deductions for superstructures.
43.15-65 Sheer, general.
43.15-67 Standard sheer profile.
43.15-70 Measurement of variations from standard sheer profile.
43.15-73 Correction for variations from standard sheer profile.
43.15-75 Addition for deficiency in sheer.
43.15-77 Deduction for excess sheer.
43.15-80 Standard round of beam.
43.15-83 Round of beam correction.
43.15-85 Summer freeboard.
43.15-87 Tropical freeboard.
43.15-90 Winter freeboard.
43.15-93 Winter North Atlantic freeboard.
43.15-95 Fresh-water freeboard.
43.15-97 Freeboard table for steamers.
43.15-98 Reduced freeboards for steamers having superior design and operational features, and engaged on United States coastwise and/or intercoastal voyages.

Subpart 43.20—Load Lines for Sailing Vessels

43.20-1 Lines to be used on sailing vessels in connection with the disk.
43.20-5 Conditions of assignment of sailing vessel load lines.
43.20-10 Computation of freeboard, sailing vessels.
43.20-15 Depth for freeboard, sailing vessels (D).
43.20-20 Coefficient of fineness, sailing vessels (c).
43.20-25 Superstructures in wood sailing vessels.
43.20-30 Deductions for sailing vessel superstructures.
43.20-35 Minimum freeboards for sailing vessels.
43.20-40 Freeboard table for sailing vessels.
43.20-45 Freeboard for wood sailing vessels.

Subpart 43.25—Load Lines for Steamers Carrying Timber Deck Cargoes

Sec.
43.25-1 Definitions.
43.25-5 Marks on the vessel's sides; timber cargo; timber load lines.
43.25-10 Construction of vessel; timber cargo.
43.25-15 Superstructures; timber cargo.
43.25-20 Machinery casings; timber cargo.
43.25-25 Double bottom tanks; timber cargo.
43.25-30 Bulwarks; timber cargo.
43.25-35 Deck openings covered by timber deck cargo.
43.25-40 Stowage; timber cargo.
43.25-45 Protection of crew, access to machinery space; timber cargo.
43.25-50 Steering arrangements; timber cargo.
43.25-55 Uprights; timber cargo.
43.25-60 Lashings; timber cargo.
43.25-65 Plans; timber cargo.
43.25-70 Computation of freeboard; timber cargo.

Subpart 43.30—Load Lines for Tankers

43.30-1 Tanker load line markings.
43.30-5 Construction of tanker.
43.30-10 Forecastle; tanker.
43.30-15 Machinery casings; tanker.
43.30-20 Gangway; tanker.
43.30-25 Protection of crew; access to machinery space; tanker.
43.30-30 Hatchways; tanker.
43.30-35 Ventilators; tanker.
43.30-40 Freeing arrangements; tankers.
43.30-45 Plans; tanker.
43.30-50 Computation of freeboard; tanker.
43.30-55 Deductions for detached superstructures; tankers.
43.30-60 Deduction for excess sheer; tanker.
43.30-65 Winter North Atlantic freeboard; tanker.
43.30-70 Freeboard table for tankers.
43.30-75 Freeboard table for tankers on United States coastwise and/or intercoastal voyages.

Subpart 43.35—Lumber Schooners

43.35-1 Load line marks for vessels specially constructed for the carriage of complete cargoes of timber (lumber schooner type).

Subpart 43.40—Zones and Seasonal Areas and Miscellaneous Requirements

43.40-1 Boundaries of the zones and seasonal areas.
43.40-5 Fees, travel expenses.

Sec.
43.40-15 Titles of load line laws and rules regarded as equivalent to the British Board of Trade Rules, 1906.

AUTHORITY: Sec. 2, 45 Stat. 1493, as amended, sec. 2, 49 Stat. 888, as amended, sec. 6(b)(1), 80 Stat. 938; 46 U.S.C. 85a, 88a, 49 U.S.C. 1655(b); 49 CFR 1.46(b) (35 FR 4959).

SOURCE: CGFR 65-50, 30 FR 16730, Dec. 30, 1965, unless otherwise noted.

Subpart 43.01—Administration

NOMENCLATURE CHANGES: 45 FR 64586, Sept. 30, 1980.

§ 43.01-1 Establishment of load lines.

(a) Load lines are established for existing merchant vessels of 150 gross tons or over in conformity with the Act of March 2, 1929, as amended (46 U.S.C. 85-85g), the Coastwise Load Line Act, 1935, as amended (46 U.S.C. 88-88i), or the current International Load Line Convention.

(b) Load lines for existing merchant vessels of 150 gross tons or over shall be pursuant to the regulations in this part when such vessels are not in compliance with the requirements in Part 42 of this subchapter and:

(1) Engage in foreign voyages by sea, or arrive within the jurisdiction of the United States or her possessions from foreign voyages by sea, in both cases the Great Lakes excepted; or,

(2) Engage in coastwise voyages by sea (domestic), the Great Lakes excepted.

(c) The load line regulations for merchant vessels which engage in voyages on the Great Lakes are in Part 45 of this subchapter. The load line regulations applicable to coastwise load lines for steam colliers, barges, and self-propelled barges in special services are in Part 44 of this subchapter.

(d) With respect to the enforcement of the regulations in this subchapter, the following rulings have been made:

(1) Vessels which engage in voyages from one port or place in the United States (including Alaska and Hawaii) to another port or place in the United States, or between ports or places in the same U.S. possession, and during such voyages pass outside the line dividing inland waters from the high seas are subject to the Coastwise Load Line Act.

(2) Vessels which engage in voyages from a port or place in the United States on the Atlantic Coast or Coast of the Gulf of Mexico to a port or place in the United States on the Pacific Coast (including Alaska and Hawaii), or vice versa, are subject to the Coastwise Load Line Act.

(3) Vessels which engage in voyages from one port or place in the United States to a port or place in a possession, or vice versa, or between ports or places in two different U.S. possessions, and pass outside the line dividing inland waters from the high seas are subject to the Coastwise Load Line Act, and the current International Load Line Convention. Since convention requirements are at least equivalent to coastwise requirements, load line assignment and certification under convention requirements only, is necessary.

(4) Vessels which engage in voyages from a port or place in the United States or her possessions and pass outside the line dividing inland waters from the high seas and navigate on the high seas, and then return to the same port or place are subject to the Coastwise Load Line Act.

(5) Vessels which engage in foreign voyages and pass outside the line dividing inland waters from the high seas are subject to the Act of March 2, 1929, as amended, and the current International Load Line Convention.

(6) Vessels which engage in voyages from a port or place in the United States to another port or place in the United States but during such voyages stop at a foreign port or place are considered to be on foreign voyages and subject to the requirements for such voyages.

(e) In concurrence with related Canadian regulations, the waters of the St. Lawrence River west of a straight line drawn from Cap de Rosiers to West Point Anticosti Island, and west of a line along 63° W. longitude from Anticosti Island to the north shore of the St. Lawrence River shall be considered as a part of the Great Lakes.

(f) This part shall not apply to merchant vessels on foreign voyages that are being towed and which are carrying neither cargo nor passengers.

[CGFR 65-50, 30 FR 16730, Dec. 30, 1965, as amended by CGFR 66-33, 31 FR 15280, Dec. 6, 1966; CGFR 68-60, 33 FR 10076, July 12, 1968; CGFR 68-126, 34 FR 9018, June 5, 1969]

§ 43.01-15 Timber cargoes.

(a) A steamer (other than a tanker or a vessel assigned load lines on a tanker basis) which has been surveyed and marked as provided by §§ 43.01-10, 43.05-1—43.15-97, may on application by the owner be surveyed and marked with timber load lines applicable only when carrying timber deck cargoes, and the steamer when carrying a deck cargo complying with the provisions of §§ 43.25-5 to 43.25-70, may be loaded to the timber load line as determined by this part applicable to the voyage if being:

(1) A new steamer, it complies with the conditions and provisions prescribed in §§ 43.25-5—43.25-70.

(2) An existing steamer (other than one defined in § 43.01-15) if it complies with the conditions and provisions of §§ 43.25-5—43.25-70, (other than § 43.25-15), but the vessel shall comply in principle, so far as is reasonable and practicable, with the conditions and provisions prescribed by § 43.25-15; *Provided*, That in assigning a timber load line to an existing steamer there shall be made such additions to the freeboard as shall be reasonable, having regard to the extent to which such steamer falls short of full compliance with the conditions and provisions prescribed in § 43.25-15.

(b) Existing vessels propelled by either sail or steam which have been specially constructed to carry complete cargoes of timber (that is, of the lumber schooner type) when carrying a complete cargo of timber will be marked with a load line. This load line will be applicable to all seasons and zones, and the assignment of and the certification of the load line will be made after consideration of the vessel's experience in similar voyages and of the condition of the vessel and her appliances. The conditions of assignment as required by §§ 43.25-5—43.25-70, are to be complied with so far as is reasonable and practicable. The Commandant, U.S. Coast Guard, shall approve the assignment of a load line for vessels of this type when such line is determined by experience.

(c) Existing steamers which have been specially constructed to carry complete cargoes of timber (that is, steam lumber schooner type) will be surveyed and marked and the marks certified in accordance with the conditions and provisions of §§ 43.05-1—43.15-97, and these marks will be applicable when the steamers are engaged on voyages laden with a cargo other than a complete timber cargo.

(d) Existing sailing vessels of the lumber schooner type will be surveyed and marked and the marks certified in accordance with the conditions and provisions of §§ 43.20-1—43.20-45, and these marks will be applicable when engaged on a voyage laden with cargo other than a complete timber cargo.

[CGFR 65-50, 30 FR 16730, Dec. 30, 1965, as amended by CGFR 68-60, 33 FR 10076, July 12, 1968]

CROSS REFERENCES: For approval of Commandant, U.S. Coast Guard, see § 43.01-100.

§ 43.01-20 Tankers.

(a) A steamer specially constructed for the carriage of liquid cargoes in bulk, which has been surveyed as provided by § 43.01-10, shall be marked with tanker load lines and the marks certified as correct if being:

(1) A new vessel, it complies with the conditions and provisions prescribed in §§ 43.30-1—43.30-75.

(2) An existing vessel, it complies with the conditions and provisions in §§ 43.30-5, 43.30-20—43.30-35, and, also in principle so far as is reasonable and practicable with §§ 43.30-10, 43.30-15, 43.30-40, providing that in assigning a tanker load line to an existing vessel such additions to the freeboard shall be made as is reasonable, having regard to the extent to which the vessel falls short of full compliance with the conditions and provisions prescribed in §§ 43.30-10, 43.30-15, and 43.30-40.

§ 43.01-25 New and existing vessels.

(a) The definitions of the terms "new vessel" and "existing vessel" are in §§ 42.05-50 and 42.05-30 respectively. For the purposes of regulations in this part these terms are further modified as set forth in this section.

(b) The marking assignment and certification of all vessels whose keels are laid, or which are at a similar stage of construction, on or after July 21, 1968, shall meet the requirements in Part 42 of this subchapter. These vessels are considered to be "new vessels" for use of the certificate forms in Subpart 42.50 of this subchapter.

(c) For the purpose of certification of load lines on the International Load Line Certificate in § 42.50-5 of this subchapter, all vessels complying with the requirements in this Part are considered to be "existing" vessels. However, for application of requirements in this Part for load line marking and assignment, a "new vessel" is one whose keel was laid on or after July 1, 1932, and prior to July 21, 1968; all other vessels whose keels were laid prior to July 1, 1932, and engaged on international voyages are regarded as "existing vessels".

(d) For the purpose of certification of load lines on the Coastwise Load Line Certificate in § 42.60-15 of this subchapter, all vessels complying with the Coastwise Load Line requirements in this Part are considered to be "existing" vessels. However, for application of requirements in this Part for load line marking and assignment, a "new vessel" is one whose keel was constructively laid prior to July 21, 1968, and on or after November 27, 1935, if of 4,000 gross tons and over, or on or after August 27, 1936, if less than 4,000 gross tons; all other vessels whose keels were laid prior to November 27, 1935, or August 27, 1936, respectively, and engaged on coastwise voyages are regarded as "existing vessels".

[CGFR 68-60, 33 FR 10076, July 12, 1968, as amended by CGFR 68-126, 34 FR 9018, June 5, 1969]

§ 43.01-30 Vessels of special type.

(a) For steamers over 300 feet in length possessing constructional features similar to those of a tanker which afford extra invulnerability against the sea, a reduction in freeboard from that determined under §§ 43.15-1—43.15-97, may be granted.

(b) The amount of such reduction shall be determined by the assigning authority in relation to the freeboard assigned to tankers, having regard to the degree of compliance with the condition of assignment laid down for these vessels and the degree of subdivision provided. The freeboard assigned to such a vessel shall in no case be less than would be assigned to the vessel as a tanker.

(c) Before assignment or certification of the load lines for vessels of special type, the approval of the Commandant, U.S. Coast Guard, shall be obtained.

Cross Reference: For approval of the Commandant, U.S. Coast Guard, see § 43.01-100.

§ 43.01-32 Stability.

(a) The rules of this Part necessarily assume that the nature and stowage of the cargo, ballast, etc., are such as to secure sufficient stability for the vessel.

(b) Having regard for the fact that certain vessels, such as those carrying all their cargo as deck cargo, may need to have the amount of cargo and resulting draft limited by stability considerations, the load line assignments of vessels, which are subject to the stability test requirements contained in § 31.10-30 in Subchapter D (Tank Vessels) or in Subpart 93.05 in Subchapter I (Cargo and Miscellaneous Vessels) of this chapter, shall in no case be deeper than permitted by the results of such tests.

(c) Load line assignments to vessels not subject to inspection will also be made subject to the results of a stability test if the design and service of the vessels are such as to indicate the need for a draft limitation based thereon.

(d) Load line assignments made to vessels before the results of stability tests are known shall be regarded as conditional and subject to verification by the Commandant.

§ 43.01-35 Marks to indicate load lines.

(a) Marks to indicate the maximum mean drafts to which a vessel can be lawfully submerged, in the various circumstances and seasons, shall be permanently marked on each side of the vessel in the form, manner, and location provided by this Part.

§ 43.01-40 Assignment and certification; assigning authority.

(a) The American Bureau of Shipping is appointed to assign load lines and to determine whether the position of and the manner of marking each vessel has been performed in accordance with this Part and the applicable provisions in the Act of March 2, 1929, as amended (46 U.S.C. 85-85g), or the Coastwise Load Line Act, 1935, as amended (46 U.S.C. 88-88i). The American Bureau of Shipping is authorized to issue a load line certificate, certifying to the correctness of the marks, under its own hand and seal. Its mailing address is American Bureau of Shipping, 45 Broad Street, New York, N.Y., 10004.

(1) As provided in section 3 of the Act of March 2, 1929, as amended (46 U.S.C. 85b), and section 3 of the Coastwise Load Line Act, 1935, as amended (46 U.S.C. 88b), the Commandant, United States Coast Guard, may, at the request of a shipowner, appoint any other recognized classification society which he may approve, as the load line assigning authority.

(2) The American Bureau of Shipping, or other approved load line assigning agency, is authorized to renew from time to time by endorsement a load line certificate.

(3) Load line certificates will not be issued until the load line marks have been verified. This certificate will be issued in duplicate, one copy being delivered to the owner or master of the vessel and one copy, together with a summary of the data used to determine the load line, will be forwarded to the Commandant, United States Coast Guard, Washington, D.C., 20226. Each new vessel, after January 1, 1948, when receiving its first load line certificate, shall be also furnished a copy of the load line survey report, which shall be retained on board the vessel for the information of inspectors and surveyors when carrying out subsequent load line surveys.

(b) As referred to in this subchapter, the term "assigning authority" or "American Bureau of Shipping" shall refer either to that society or to such other society as may have been specifically approved by the Commandant as a load line assigning authority for the vessel concerned.

(c) The scale of maximum fees payable to the assigning authority for this service is contained in § 43.40-5.

§ 43.01-50 Surveys.

(a) *Steel vessels.* (1) The vessel is to be placed in drydock to determine the condition of the hull plating, etc.

(2) The holds, 'tween decks, peaks, bilges, engine and boiler spaces, and bunkers are to be examined to determine the condition of the framing, etc.

(3) Deep tanks and other tanks which form part of the vessel are to be examined internally.

(4) Where a double bottom is fitted, the tanks are to be examined internally. Where double bottom and other tanks are used for fuel-oil bunkers, such tanks need not be cleaned out, provided the surveyors are able to determine by an external examination that their general condition is satisfactory.

(5) The decks are to be examined.

(6) The hatch covers, hatch beams, and fore-and-afters, tarpaulins, battens and wedges, the hatchway and ventilator coamings, companionways, the engine and boiler casings, the superstructures on the freeboard deck, and all means of protecting the openings in the freeboard deck and superstructures and bulkheads are to be examined.

(7) All air pipe outlets, scuppers, sanitary discharges in the vessel's sides, and air ports are to be examined.

(8) All gangways, cargo, and coaling ports or other similar openings in vessel's sides are to be examined.

(9) Guard rails, gangways, and shutters in freeing ports are to be examined.

(10) All eye plates or similar fittings for timber deck cargo lashings and sockets for uprights are to be examined.

(11) Where, owing to the age and condition of the vessel, the surveyors deem it necessary, the shell and deck plating may be required to be drilled in order to ascertain the then thickness of such plating.

(b) *Wood vessels.* (1) The vessel is to be placed on a drydock or a slip way and the keel, stem, stern frame or stern post and outside planking are to be examined. Caulking is to be tried at such places about the planking as deemed necessary by the surveyors.

(2) Careful examination must be made for faulty fastenings and such bolts or treenails must be backed out, or otherwise dealt with, as may be deemed necessary by the surveyors.

(3) Careful examination is to be made of the entire structure and if considered necessary borings are to be made to ascertain the condition of the materials; should these disclose cause for further examination, listings are to be made where required to satisfy the surveyors as to the true condition of the vessel.

(4) The holds, 'tween decks, peaks, bilges, engine and boiler spaces, and bunkers are to be examined.

(5) The decks are to be examined and bored where necessary.

(6) The hatch covers, hatch beams, fore-and-afters, tarpaulins, battens and wedges, the hatchway and ventilator coamings, companionways, the engine and boiler casings, the superstructures on the freeboards deck, and all means of protecting the openings in the freeboard deck and superstructures and bulkheads are to be examined.

(7) All air pipe outlets, scuppers, sanitary discharges in the vessel's sides, and air ports are to be examined.

(8) All gangways, cargo, and coaling ports or other similar fittings in the vessel's sides are to be examined.

(9) Guard rails, gangways, and shutters in freeing ports are to be examined.

(10) All eye plates or similar fittings for timber deck cargo lashings and sockets for uprights are to be examined.

(c) *Correction of deficiencies.* (1) Any such parts or fittings of the vessel as are found to be in an unsatisfactory condition are to be repaired or renewed in order to place the vessel in a seaworthy condition so as to be eligible for a load line certificate.

§ 43.01-55 Annual inspection.

(a) A vessel having been marked as provided by this part, and the mark certified as correct, will be inspected at intervals of approximately 12 months in order to insure the maintenance in an effective condition of the fittings and appliances for the:

(1) Protection of openings,

(2) Guard rails,

(3) Freeing port,

(4) Means of access to crews' quarters, and

(5) That there have not been alterations made to the hull or superstructures which would affect the calculations determining the position of the load lines.

(b) The American Bureau of Shipping is appointed to make this inspection and to report thereon to the owners of the vessel.

(c) The scale of fees payable to the American Bureau of Shipping for this service is contained in § 43.40-5.

[CGFR 65-50, 30 FR 16730, Dec. 30, 1965, as amended by CGFR 68-126, 34 FR 9018, June 5, 1969]

§ 43.01-60 Application for assignment, surveys, and certification.

(a) The application for assignment, surveys, and certification (including reissue) of load lines under this Part shall be made by the owner, master, or agent in accordance with the procedures and requirements in §§ 42.11-1 to 42.11-20, inclusive of this subchapter.

[CGFR 68-126, 34 FR 9018, June 5, 1969]

§ 43.01-65 Application for annual inspection.

(a) Application for annual load line inspection required by § 43.01-55 shall be made in writing to the American Bureau of Shipping by the owners of a vessel.

§ 43.01-70 Equivalents.

(a) Where in this Part it is provided that a particular fitting or appliance, or type thereof, shall be fitted or carried in a vessel, or that any particular arrangement shall be adopted, there may be substituted any other fitting or appliance or type thereof, or any other arrangement: *Provided,* That such fitting, appliance or arrangement shall be considered a suitable equivalent by the assigning authority and the approval of the Commandant, U.S. Coast Guard, for such substitution shall have been issue.

CROSS REFERENCE: For approval of Commandant, U.S. Coast Guard, see § 43.01-100.

§ 43.01-75 Validity and reissue of certificates.

(a) The assignment of load lines is conditioned upon the structural efficiency of the vessel and upon the provision of effective protection to vessel and crew. The Act of March 2, 1929, as amended (46 U.S.C. 85-85g), and the Coastwise Load Line Act, 1935, as amended (46 U.S.C. 88-88i), provide that every vessel required to be marked shall be surveyed. The assigning authority at least once in each 5 years shall survey such a vessel to determine that the load lines are then correctly placed as required by this part. If the load line mark be found correct for the vessel in the condition she is then in, the certificate shall be reissued for such time as the condition of the vessel then warrants, but in no case for a period longer than 5 years. The facts associated with annual revalidation and extension of certificate shall be attested to by endorsement upon the back of the certificate.

[CGFR 68-126, 34 FR 9018, June 5, 1969]

§ 43.01-85 Cancellation of certificate.

(a) Notwithstanding the marking of a load line and the issuance of a load line certificate, the certificate will be canceled if:

(1) The annual load line inspection required by § 43.01-55 has not been carried out or that the items described under § 43.01-55(a) (1), (2), (3), and (4) are not maintained in an effective condition.

(2) The survey required by § 43.01-50 has not been carried out or that any defects disclosed by the survey have not been corrected.

(3) Due to any cause the conditions of assignment have not been maintained as provided by this part, or alterations have been made to hull or superstructures which affect the calculations made to determine the location of the load line.

§ 43.01-90 Zones and seasonal areas.

(a) A vessel coming under the provisions of the Act of March 2, 1929, as amended (46 U.S.C. 85-85g), or the Coastwise Load Line Act, 1935, as amended (46 U.S.C. 88-88i), shall conform to the conditions applicable to the zones and seasonal areas as described in §§ 42.30-5 to 42.30-35, inclusive in this subchapter.

(b) A port located on the boundary line between two zones shall be regarded as within the zone from which the vessel arrived or into which the vessel departs.

(c) No vessel to which these acts apply shall be loaded so as to submerge the load line then applicable to her voyage. When loading a vessel in a favorable zone for a voyage on which the vessel will enter a less favorable zone, such allowance must be made that the vessel, when crossing into the less favorable zone, will conform to the regulations and freeboard for the less favorable zone.

[CGFR 65-50, 30 FR 16730, Dec. 30, 1965, as amended by CGFR 68-70, 33 FR 10076, July 12, 1968]

§ 43.01-95 Logbook entries.

The requirements of § 42.07-20 of this subchapter shall apply to all vessels subject to this part.

[CGFR 68-126, 34 FR 9019, June 5, 1969]

§ 43.01-97 Control.

The requirements of § 42.07-60 of this subchapter apply.

[CGFR 68-126, 34 FR 9019, June 5, 1969]

§ 43.01-100 Approval of the Commandant, U.S. Coast Guard.

The requirements of § 42.07-25 of this subchapter apply.

[CGFR 68-126, 34 FR 9019, June 5, 1969]

Subpart 43.05—General Rules for Determining Maximum Load Lines of Merchant Vessels

§ 43.05-1 Definitions.

(a) *Steamer.* (1) The term "steamer" or "steamship" includes all vessels having sufficient means for mechanical propulsion, except where provided with sufficient sail area for navigation under sails alone.

(2) A vessel fitted with mechanical means of propulsion and with sail area insufficient for navigation under sails alone may be assigned a load line under §§ 43.15-1—43.15-97.

(3) A lighter, barge, or other vessel without independent means or propulsion, when towed, is to be assigned a load line under §§ 43.15-1—43.15-97.

(b) *Sailing vessel.* The term "sailing vessel" includes all vessels provided with sufficient sail area for navigation under sails alone, whether or not fitted with mechanical means of propulsion.

(c) *Flush-deck vessel.* A flush-deck vessel is one which has no superstructure on the freeboard deck.

(d) *Superstructure.* A superstructure is a decked structure on the freeboard deck extending from side to side of the vessel. A raised quarter-deck is considered a superstructure.

(e) *Load line.* The load line is the line defining the maximum mean draft to which a vessel may be lawfully submerged. It is the lower limit of the freeboard as determined by the regulations in this part having regard to the various conditions and seasons.

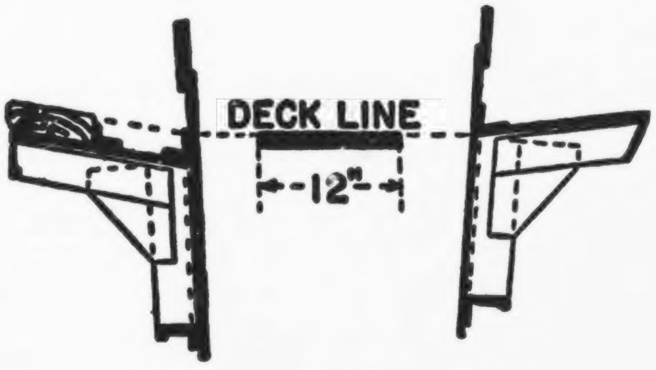
(f) *Freeboard.* The freeboard assigned is the distance measured vertically downward at the side of the vessel amidships from the upper edge of the deck line to the upper edge of the load line.

(g) *Freeboard deck.* The freeboard deck is the deck from which the freeboard is measured, and is the uppermost complete deck having permanent means of closing all openings in weather portions of the deck in accordance with §§ 43.10-1—43.10-45. It is the upper deck in flush-deck vessels and vessels with detached superstructures. In vessels having discontinuous freeboard decks within superstructures which are not intact, or which are not fitted with class 1 closing appliances, the lowest line of the deck below the superstructure deck is taken as the freeboard deck.

(h) *Amidships.* Amidships is the middle of the length of the summer load waterline, as defined in § 43.15-1.

§ 43.05-5 Deck line.

(a) The deck line is a horizontal line 12 inches in length and 1 inch in breadth. It is to be marked amidships on each side of the vessel, and its upper edge is to pass through the point where the continuation outward of the upper surface of the freeboard deck intersects the outer surface of the shell. (See fig. 43.05-5(a).) Where the deck is partly sheathed amidships, the upper edge of the deck line is to pass through the point where the continuation outward of the upper surface of the actual sheathing at amidships intersects the outer surface of the shell.



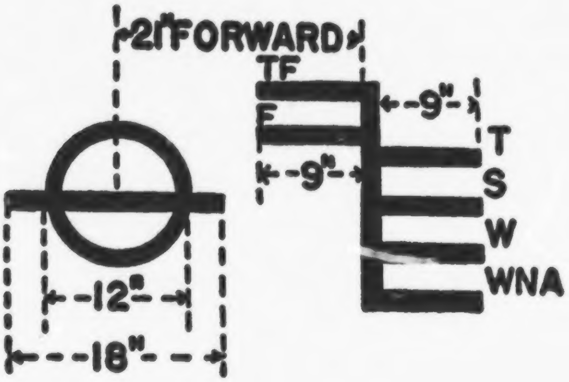


FIGURE 43.05–5(a)

§ 43.05–10 Load line disk.

(a) The load line disk is 12 inches in diameter and is intersected by a horizontal line 18 inches in length and 1 inch in breadth, the upper edge of which passes through the center of the disk. The disk is to be marked amidships below the deck line.

§ 43.05–15 Lines used with disk.

(a) The lines which indicate the maximum load line in different circumstances and in different seasons (see § 43.40–1) are to be horizontal lines, 9 inches in length and 1 inch in breadth, which extend from, and are at right angles to, a vertical line marked 21 inches forward of the center of the disk, except as provided otherwise in paragraph (d) of this section. (See Figure 43.05–5(a).)

(b) The following are the lines to be used:

(1) *Summer load line.* The summer load line is indicated by the upper edge of the line which passes through the center of the disk and also by a line marked "S."

(2) *Winter load line.* The winter load line is indicated by the upper edge of a line marked "W."

(3) *Winter North Atlantic load line.* The winter North Atlantic load line is indicated by the upper edge of a line marked "WNA."

(4) *Tropical load line.* The tropical load line is indicated by the upper edge of a line marked "T."

(5) *Fresh-water load lines.* The fresh-water load line in summer is indicated by the upper edge of a line marked "F." The difference between the fresh-water load line in summer and the summer load line is the allowance to be made for loading in fresh water at the other load lines. The tropical fresh-water load line is indicated by the upper edge of a line marked "TF."[2] (This provision for deeper load-

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[2] Where seagoing steamers navigate a river or inland water, deeper loading is permitted corresponding to the weight of fuel, etc., required for consumption between the point of departure and the open sea.

ing in fresh water is not applicable to the Great Lakes.)

(c) Where the draft is restricted on a basis of subdivision or stability and this draft is less than any of the various seasonal drafts permitted by this part the center of the disk shall be located on the line of this restricted draft and it shall be applicable to all zones and seasons. If such a permissible maximum draft comes between the seasonal markings, the seasonal markings below shall also be added. A fresh-water load line may be marked forward of the disk as provided in this section.

(d) Domestic vessels eligible for operation at the freeboards indicated by §§ 43.15-87(b), 43.15-90(b), 43.15-98(a), or 43.30-1(b) shall have the related winter, summer, tropical, fresh, and tropical fresh water marks located abaft the disk and surmounted by the letter "C." (See Figure 43.05-15(d).) While a complete set of additional marks is shown by this Figure, vessels also marked forward of the disk in accordance with § 43.05-5(a) need show abaft the disk only those additional marks which are necessary. Vessels departing on foreign voyages shall only bear the load line marks forward of the disk marked in accordance with § 43.05-5(a).

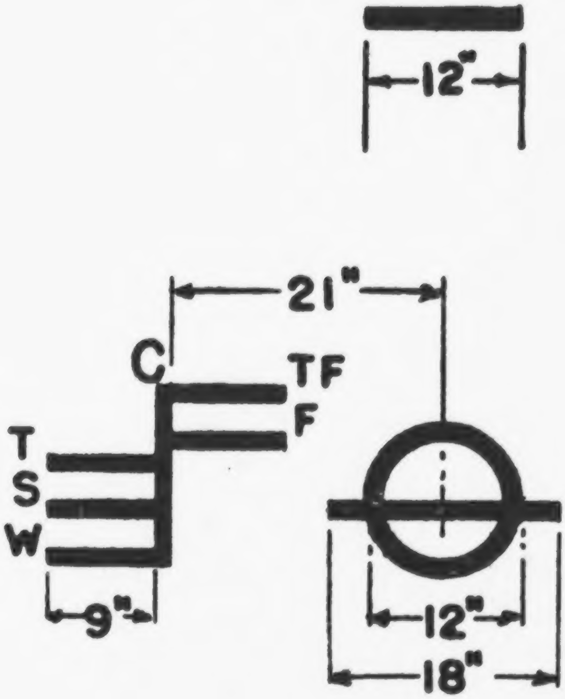

FIGURE 43.05-15(d)

§ 43.05–20 Mark of assigning authority.

(a) The authority by whom the load lines are assigned may be indicated by letters measuring about 4½ by 3 inches marked alongside the disk and above the centerline.

§ 43.05–25 Details of marking.

(a) The disk, lines, and letters are to be painted in white or yellow on a dark ground or in black on a light ground. They are also to be carefully cut in or center punched on the sides of iron and steel vessels, and on wood vessels they are to be cut into the planking for at least one-eighth of an inch. The marks are to be plainly visible, and, if necessary, special arrangements are to be made for this purpose.

§ 43.05–30 Verification of marks.

(a) The load lines certificate is not to be delivered to the vessel until a surveyor of the assigning authority has certified that the marks are correctly and permanently indicated on the vessel's side.

Subpart 43.10—Conditions of Assignment of Load Lines

§ 43.10–1 Construction of vessel.

(a) The assignment of load lines is conditional upon the vessel being structurally efficient and upon the provision of effective protection to vessel and crew.

(b) Sections 43.10–1—43.10–100 apply to vessels to which minimum freeboards are assigned. In vessels to which greater freeboards than the minimum are assigned, the protection is to be relatively as effective.

(c) Passenger vessels; subdivision and stability load lines: Where in passenger vessels the position of the maximum load lines is determined by the application of subdivision and stability regulations as provided in Part 46 of this subchapter the provisions of this part shall also be effective insofar as they are applicable.

§ 43.10–5 Cargo and other hatchways not protected by superstructures.

(a) The construction and fitting of cargo and other hatchways in exposed positions on freeboard and superstructure decks are to be at least equivalent to the standards laid down in §§ 43.10–10—43.10–45.

(b) Where hatch covers are of adequate metal construction, sealed watertight against pliable gaskets by dogs or other suitable means, as approved by the Load Line Assigning Authority, the application of the requirements of §§ 43.10–10—43.10–45 will be modified accordingly.

§ 43.10–10 Hatchway coamings.

(a) The height of hatchway coamings on freeboard decks is to be at least 24 inches above the deck. The height of coamings on superstructure decks is to be at least 24 inches above the deck if situated within a quarter of the ship's length from the stem, and at least 18 inches if situated elsewhere.

(b) Coamings are to be of steel, are to be substantially constructed and, where required to be 24 inches high, are to be fitted with an efficient horizontal stiffener placed not lower than 10 inches below the upper edge, and fitted with efficient brackets or stays from the stiffener to the deck, at intervals of not more than 10 feet. Where end coamings are protected, the requirements of this section may be modified.

§ 43.10–15 Hatchway covers.

(a) Covers to exposed hatchways are to be efficient, and where they are made of wood, the finished thickness is to be at least 2⅜ inches in association with a span of not more than 5 feet. The width of each bearing surface for these hatchway covers is to be at least 2½ inches.

§ 43.10–20 Hatchway beams and fore-and-afters.

(a) Where wood hatchway covers are fitted the hatchway beams and fore-and-afters are to be of the scantlings and spacing given in Table 43.10–20(a1) where coamings 24 inches high are required, and as given in Table 43.10–20(a2) where coamings 18 inches high are required. Angle bar mountings on the upper edge are to extend continuously for the full length of each beam. Wood fore-and-afters are to be steel shod at all bearing surfaces.

TABLE 43.10–20(a1)—HATCHWAY BEAMS AND FORE-AND-AFTERS FOR VESSELS 200 FEET OR MORE IN LENGTH [1] [2]

[Coamings 24 inches in height]

Breadth of hatchway		Beams with fore-and-afters, spacing center to center (inches)			Beams without fore-and-afters, spacing center to center (inches)	
Mounting	Inches	6'0"	8'0"	10'0"	4'0"	5'0"
Hatchway beams:						
10'0"	3 by 3 by 0.40A	11 by 0.30P	12 by 0.32P	14 by 0.34P	9 by 0.46BP	10 by 0.50BP
12'0"	3 by 3 by 0.40A	12 by 0.32P	14 by 0.34P	17 by 0.36P	11 by 0.50BP	12 by 0.50BP.
14'0"	3 by 3 by 0.42A	14 by 0.34P	17 by 0.36P	20 by 0.38P	12 by 0.50BP	12 by 0.32P.
16'0"	3½ by 3 by 0.42A	16 by 0.36P	19 by 0.38P	22 by 0.38P	12 by 0.32P	14 by 0.34P.
18'0"	4 by 3 by 0.44A	18 by 0.36P	21 by 0.38P	25 by 0.40P	14 by 0.34P	16 by 0.36P.
20'0"	4 by 3 by 0.44A	20 by 0.38P	24 by 0.40P	28 by 0.42P	15 by 0.34P	18 by 0.36P.
22'0"	4½ by 3 by 0.46A	22 by 0.38P	26 by 0.42P	30 by 0.44P	16 by 0.36P	19 by 0.36P
24'0"	5 by 3½ by 0.46A	23 by 0.40P	28 by 0.42P	32 by 0.44P	17 by 0.36P	20 by 0.38P.
26'0"	5½ by 3½ by 0.48A	24 by 0.40P	29 by 0.42P	34 by 0.46P	18 by 0.36P	21 by 0.38P.
28'0"	6 by 3½ by 0.50A	25 by 0.40P	31 by 0.44P	36 by 0.48P	19 by 0.38P	22 by 0.38P.
30'0"	6 by 3½ by 0.52A	26 by 0.42P	32 by 0.44P	38 by 0.48P	20 by 0.38P	23 by 0.40P.

Length of fore-and-afters	Mounting (inches)	Bulb plate center fore-and-afters, spacing center to center (inches)			Bulb angle side fore-and-afters, spacing center to center (inches)		
		3'0"	4'0"	5'0"	3'0"	4'0"	5'0"
6'0"	2½ by 2½ by 0.36	6 by 0.36	6½ by 0.38	7 by 0.38	6 by 3 by 0.36	6½ by 3½ by 0.38	7 by 3½ by 0.38
8'0"	2½ by 2½ by 0.38	7 by 0.42	8 by 0.44	9 by 0.44	7 by 3½ by 0.42	8 by 3 by 0.44	9 by 3½ by 0.44
10'0"	2½ by 2½ by 0.40	8 by 0.50	9½ by 0.50	11 by 0.50	8 by 3½ by 0.50	9½ by 3½ by 0.50	11 by 3½ by 0.50

Length of fore-and-afters	Wood center fore-and-afters, spacing center to center						Wood side fore-and-afters, spacing center to center					
	3′0″		4′0″		5′0″		3′0″		4′0″		5′0″	
	D (inches)	B (inches)	D (inches)	B (inches)	D (inches)	B (inches)	D (inches)	B (inches)	D (inches)	B (inches)	D (inches)	B (inches)
6′0″	5½	7	6	7	6½	7	5½	5½	6	6	6½	6
8′0″	6½	7	7½	7	8	7	6½	6½	7½	7	8	7
10′0″	8	7	8½	8	9	9	8	7	8½	8	9	9

A=Plain angle. BP=Bulb plate. P=Plate. D=Depth. B=Breadth.

[1] In vessels not exceeding 100 feet in length, the depths of beams which are formed of plates and angles may be 60 percent of the depths given above; the depths of beams and steel fore-and-afters formed of bulb angle or bulb plate section may be 80 percent of the depths given above; the thickness of plates, bulb angles, and bulb plates should correspond to the thickness tabulated for the reduced depths with a minimum thickness of 0.30 inch; the depths and breadths of wood fore-and-afters may be 80 percent of those given in the tables for side fore-and-afters, but the center fore-and-afters must be not less than 6½ inches wide. In vessels between 100 feet and 200 feet in length, the sizes of the beams and fore-and-afters are to be determined by linear interpolation.

[2] Depths for hatchway beams are at the middle of the length and are measured from the top mounting to the lower edge. Depths for fore-and-afters are measured from the underside of the hatch covers to the lower edge. Sizes for intermediate lengths and spacing are obtained by interpolation. Where plates are specified, two angles of the size given for mountings, are to be fitted at the upper and at the lower part of the beam. Where bulb plates are specified, two angles, of the size given for mountings, are to be fitted at the upper part of the beam or fore-and-after. Where bulb angles are specified, one angle, of the size given for mountings, is to be fitted at the upper part of the section. Where the specified flanges of an angle are of different dimensions, the larger flange is to be horizontal.

TABLE 43.10–20(a2)—HATCHWAY BEAMS AND FORE-AND-AFTERS FOR VESSELS 200 FEET OR MORE IN LENGTH [1] [2]

[Coamings 18 inches in height]

HATCHWAY BEAMS

Breadth of hatchway	Mounting (inches)	Beams with fore-and-afters, spacing center to center (inches)			Beams without fore-and-afters, spacing center to center (inches)	
		6′0″	8′0″	10′0″	4′0″	5′0″
Hatchway beams:						
10′0″	3 by 3 by 0.40A	9½ by 0.46BP	10½ by 0.50BP	11½ by 0.52BP	8 by 0.40BP	9 by 0.44BP.
12′0″	3 by 3 by 0.40A	11 by 0.50BP	11 by 0.30P	13 by 0.34P	9 by 0.44BP	10 by 0.50BP.
14′0″	3 by 3 by 0.42A	11 by 0.30P	13 by 0.32P	15 by 0.34P	10 by 0.50BP	11½ by 0.50BP.
16′0″	3½ by 3 by 0.42A	12 by 0.32P	15 by 0.34P	17 by 0.36P	11 by 0.30P	11 by 0.30P.
18′0″	4 by 3 by 0.44A	14 by 0.34P	17 by 0.36P	19 by 0.38P	11 by 0.30P	12 by 0.32P.
20′0″	4 by 3 by 0.44A	16 by 0.36P	19 by 0.38P	21 by 0.38P	12 by 0.32P	13 by 0.34P.
22′0″	4½ by 3 by 0.46A	17 by 0.36P	20 by 0.38P	23 by 0.40P	12½ by 0.32P	14 by 0.34P.
24′0″	5 by 3½ by 0.46A	18 by 0.36P	21 by 0.38P	25 by 0.40P	13 by 0.34P	14½ by 0.34P.
26′0″	5½ by 3½ by 0.48A	19 by 0.38P	22 by 0.38P	26 by 0.42P	13½ by 0.34P	15 by 0.34P.
28′0″	6 by 3½ by 0.50A	20 by 0.38P	23 by 0.40P	27 by 0.42P	14 by 0.34P	16 by 0.36P.
30′0″	6 by 3½ by 0.52A	21 by 0.38P	24 by 0.40P	28 by 0.42P	15 by 0.34P	17 by 0.36P.

TABLE 43.10-20(a2)—HATCHWAY BEAMS AND FORE-AND-AFTERS FOR VESSELS 200 FEET OR MORE IN LENGTH [1] [2]—Continued

[Coamings 18 inches in height]

HATCHWAY BEAMS

Length of fore-and-afters	Mounting (inches)	Bulb plate center fore-and-afters, spacing center to center (inches)			Bulb angle side fore-and-afters, spacing center to center (inches)		
		3′0″	4′0″	5′0″	3′0″	4′0″	5′0″
6′0″	2½ by 2½ by 0.36	5 by 0.34	5½ by 0.34	6 by 0.36	5 by 3 by 0.36	5½ by 3 by 0.34	6 by 3 by 0.36.
8′0″	2½ by 2½ by 0.38	6 by 0.38	7 by 0.40	7½ by 0.42	6 by 3 by 0.38	7 by 3 by 0.40	7½ by 3½ by 0.42.
10′0″	2½ by 2½ by 0.40	7 by 0.44	8 by 0.46	9 by 0.50	7 by 3 by 0.44	8 by 3½ by 0.46	9 by 3½ by 0.50.

Length of fore-and-afters	Wood center fore-and-afters, spacing center to center						Wood side fore-and-afters, spacing center to center					
	3′0″		4′0″		5′0″		3′0″		4′0″		5′0″	
	D (inches)	B (inches)	D (inches)	B (inches)	D (inches)	B (inches)	D (inches)	B (inches)	D (inches)	B (inches)	D (inches)	B (inches)
6′0″	5	7	5½	7	6	7	5	5	5½	5	6	5
8′0″	6	7	6½	7	7	7	6	5	6½	6	7	6
10′0″	7	7	7½	7	8	7	7	6	7½	7	8	7

A=Plain angle. BP=Bulb plate. P=Plate. D=Depth. B=Breadth.

[1] In vessels not exceeding 100 feet in length, the depths of beams which are formed of plates and angles may be 60 percent of the depths given above; the depths of beams and steel fore-and-afters formed of bulb angle or bulb plate section may be 80 percent of the depths given above; the thickness of plates, bulb angles, and bulb plates should correspond to the thickness tabulated for the reduced depths with a minimum thickness of 0.30 inch; the depths and breadths of wood fore-and-afters may be 80 percent of those given in the tables for side fore-and-afters, but the center fore-and-afters must be not less than 6½ inches wide. In vessels between 100 feet and 200 feet in length, the sizes of the beams and fore-and-afters are to be determined by linear interpolation.

[2] Depths for hatchway beams are at the middle of the length and are measured from the top mounting to the lower edge. Depths for fore-and-afters are measured from the under side of the hatch covers to the lower edge. Sizes for intermediate length and spacing are obtained by interpolation. Where plates are specified, two angles, of the sizes given for mountings, are to be fitted at the upper and at the lower part of the beam. Where bulb plates are specified, two angles, of the size given for mountings, are to be fitted at the upper part of the beam or fore-and-after. Where bulb angles are specified, one angle, of the size given for mountings, is to be fitted at the upper part of the section. Where the specified flanges of an angle are of different dimensions, the larger flange is to be horizontal.

§ 43.10-25 Carriers or sockets.

(a) Carriers or sockets for hatchway beams and fore-and-afters are to be of steel at least one-half inch thick, and are to have a width of bearing surface of at least 3 inches.

§ 43.10-30 Cleats.

(a) Strong cleats at least 2½ inches wide are to be fitted at intervals of not more than 2 feet from center to center; the end cleats are to be placed not more than 6 inches from each corner of the hatchway.

§ 43.10-35 Battens and wedges.

(a) Battens and wedges are to be efficient and in good condition.

§ 43.10-40 Tarpaulins.

(a) At least two tarpaulins in good condition, thoroughly waterproofed, and of ample strength, are to be provided for each hatchway in an exposed position on freeboard and superstructure decks. The material is to be guaranteed free from jute, and shall not be less than No. 4 cotton canvas or No. 6 hemp canvas before waterproofing, or shall be of suitable synthetic fabric as approved for this purpose by the Load Line Assigning Authority.

§ 43.10-45 Security of hatchway covers.

(a) At all hatchways in exposed positions on freeboard and superstructure decks ring bolts or other fittings for lashings are to be provided.

(b) Where the breadth of the hatchway exceeds 60 percent of the breadth of the deck in way of the hatchway, and the coamings are required to be 24 inches high, fittings for special lashings are to be provided for securing the hatchway covers after the tarpaulins are battened down.

§ 43.10-50 Cargo and other hatchways in the freeboard deck within superstructures which are fitted with closing appliances less efficient than class 1.

(a) The construction and fittings of such hatchways are to be at least equivalent to the standards laid down in § 43.10-55.

§ 43.10-55 Hatchway coamings and closing arrangements.

(a) Cargo, coaling, and other hatchways in the freeboard deck within superstructures which are fitted with class 2 closing appliances are to have coamings at least 9 inches in height and closing arrangements as effective as those required for exposed cargo hatchways whose coamings are 18 inches high.

(b) Where the closing appliances are less efficient than class 2, the hatchways are to have coamings at least 18 inches in height, and are to have fittings and closing arrangements as effective as those required for exposed cargo hatchways.

CROSS REFERENCE: For class 1 and class 2 closing appliances, see §§ 43.15-37, 43.15-40.

§ 43.10-60 Machinery space openings in exposed positions on freeboard and raised quarter-decks.

(a) Such openings are to be properly framed and efficiently enclosed by steel casings of ample strength, and where the casings are not protected by other structures their strength is to be specially considered. Doors in such casings are to be of steel, efficiently stiffened, permanently attached, and capable of being closed and secured from both sides. The sills of openings are to be at least 24 inches above the freeboard deck and at least 18 inches above the raised quarterdeck.

(b) Fiddley, funnel, and ventilator coamings are to be as high above the deck as is reasonable and practicable. Fiddley openings are to have strong steel covers permanently attached in their proper positions.

§ 43.10-65 Machinery space openings in exposed positions on superstructure decks other than raised quarter-decks.

(a) Such openings are to be properly framed and efficiently enclosed by strong steel casings. Doors in such cases are to be strongly constructed, permanently attached, and capable of being closed and secured from both sides. The sills of the openings are to be at least 15 inches above superstructure decks.

(b) Fiddley, funnel, and ventilator coamings are to be as high above the deck as is reasonable and practicable. Fiddley openings are to have strong steel covers permanently attached in their proper positions.

§ 43.10-67 Machinery space openings in the freeboard deck within superstructures which are fitted with closing appliances less efficient than class 1.

(a) Such openings are to be properly framed and efficiently enclosed by steel casings. Doors in such casings are to be strongly constructed, permanently attached, and capable of being securely closed. The sills of the openings are to be at least 9 inches above the deck where the superstructures are closed by class 2 closing appliances, and at least 15 inches abovd the deck where the closing appliances are less efficient than class 2.

CROSS REFERENCE: For class 1 and class 2 closing appliances, see §§ 43.15-37, 43.15-40.

§ 43.10-70 Flush bunker scuttles.

(a) Flush bunker scuttles may be fitted in superstructure decks, and where so fitted are to be of iron or steel, of substantial construction, with screw or bayonet joints. Where a scuttle is not secured by hinges, a permanent chain attachment is to be provided. The position of flush bunker scuttles in small vessels in special trades is to be dealt with by each assigning authority.

§ 43.10-75 Companionways.

(a) Companionways in exposed positions on freeboard decks and on decks of enclosed superstructures are to be of substantial construction. The sills of the doorways are to be of the heights specified for hatchway coamings (see §§ 43.10-10, 43.10-55). The doors are to be strongly constructed and capable of being closed and secured from both sides. Where the companionway is situated within a quarter of the vessel's length from the stem, it is to be of steel and riveted to the deck plating.

§ 43.10-77 Ventilators in exposed positions on freeboard and superstructure decks.

(a) Such ventilators to spaces below freeboard decks or decks of superstructures which are intact or fitted with class 1 closing appliances are to have coamings of steel, substantially constructed, and efficiently connected to the deck by rivets spaced four diameters apart center to center, or by equally effective means. The deck plating at the base of the coamings is to be efficiently stiffened between the deck beams. The ventilator openings are to be provided with efficient closing arrangements.

(b) Where such ventilators are situated on the freeboard deck, or on the superstructure deck within a quarter of the vessel's length from the stem, and the closing arrangements are of a temporary character, the coamings are to be at least 36 inches in height; in other exposed positions on the superstructure deck they are to be at least 30 inches in height. Where the coaming of any ventilator exceeds 36 inches in height, it is to be specially supported and secured.

§ 43.10-80 Air pipes.

(a) Where the air pipes to ballast and other tanks extend above the freeboard or superstructure decks, the exposed parts of the pipes are to be of substantial construction; the height from the deck to the opening is to be at least 36 inches in wells on freeboard decks, 30 inches on raised quarter decks, and 18 inches on other superstructure decks. Satisfactory means are to be provided for closing the openings of the air pipes.

§ 43.10-85 Gangway, cargo, and coaling ports.

(a) Openings in the sides of vessels below the freeboard deck are to be fitted with watertight doors or covers, which, with their securing appliances, are to be of sufficient strength.

§ 43.10-87 Scuppers and sanitary discharge pipes.

(a) Discharges from scuppers and sanitary pipes led through the vessel's sides from spaces below the freeboard deck are to be fitted with efficient and accessible means for preventing water from passing inboard. Each separate discharge may have an automatic nonreturn valve with a positive means of closing it from a readily accessible position above the freeboard deck, or two automatic nonreturn valves without positive means of closing, provided the upper valve is situated so that it is always accessible for examination under service conditions. The positive-action valve is to be accessible and is to be provided with means for showing whether the valve is opened or closed.

(b) Conditional upon the type and the location of the inboard ends of such openings, similar provisions may be prescribed by the assigning authority as to discharge from spaces within enclosed superstructures.

(c) Where scuppers are fitted in superstructures not fitted with class 1 closing appliances they are to have efficient means for preventing the accidental admission of water below the freeboard deck.

§ 43.10-90 Air ports.

(a) Air ports to spaces below the freeboard deck or to spaces below the superstructure deck of superstructures closed by class 1 or class 2 closing appliances are to be fitted with efficient inside deadlights permanently attached in their proper positions so that they can be effectively closed and secured watertight.

(b) Where, however, such spaces in superstructures are appropriated to passengers other than steerage passengers or to crew, the air ports may have portable deadlights stowed adjacent to the air ports, provided they are readily accessible at all times on service.

(c) The air ports and deadlights are to be of substantial and approved construction.

CROSS REFERENCE: For class 1 and class 2 closing appliances, see §§ 43.15-37, 43.15-40.

§ 43.10-95 Guardrails.

(a) Efficient guardrails or bulwarks are to be fitted on all exposed portions of freeboard and superstructure decks.

§ 43.10-97 Freeing ports.

(a) Where bulwarks on the weather portions of freeboard or superstructure decks form "wells" ample provision is to be made for rapidly freeing the decks of water and for draining them. The minimum freeing port area on each side of the vessel for each well on the freeboard deck and on the raised quarterdeck is to be that given by the following scale: The minimum area for each well on any other superstructure deck is to be one-half the area given by the scale. Where the length of the well exceeds 0.7 *L*, the scale may be modified.

SCALE OF FREEING PORT AREA

Length of bulwarks in "well" in feet:	Freeing port area on each side in square feet
15	8.0
20	8.5
25	9.0
30	9.5
35	10.0
40	10.5
45	11.0
50	11.5
55	12.0
60	12.5
65	13.0
Above 65	(1)

[1] One square foot for each additional 5 feet length of bulwark.

(b) The lower edges of the freeing ports are to be as near the deck as practicable and preferably not higher than the upper edge of the gunwale bar. Two-thirds of the freeing port area required is to be provided in the midship half of the well. In vessels with less than the standard sheer the freeing port area is to be suitably increased.

(c) All such openings in the bulwarks are to be protected by rails or bars spaced about 9 inches apart. If shutters are fitted to freeing ports, ample clearance is to be provided to prevent jamming. Hinges are to have brass pins.

§ 43.10-100 Protection of crew.

(a) Gangways, lifelines, or other satisfactory means are to be provided for the protection of the crew in getting to and from their quarters. The strength of houses for the accommodation of crew on flush deck steamers is to be equivalent to that required for superstructure bulkheads.

Subpart 43.15—Load Lines for Steamers [3]

§ 43.15-1 Length (L).

(a) The length used with the rules and freeboard tables is the length in feet on the summer load water line from the foreside of the stem to the afterside of the rudder post. Where there is no rudder post, the length is measured from the foreside of the stem to the axis of the rudder stock. For vessels with cruiser sterns, the length is to be taken as 96 percent of the total length on the designed summer load waterline or as the length from the foreside of the stem to the axis of the rudder stock if that be the greater.

§ 43.15-5 Breadth (B).

(a) The breadth is the maximum breadth in feet amidships to the molded line of the frame in iron or steel vessels and to the outside of the planking in wood or composite vessels.

§ 43.15-7 Molded depth.

(a) The molded depth is the vertical distance in feet, measured amidships, from the top of the keel to the top of the freeboard deck beam at side. In wood and composite vessels the distance is measured from the lower edge of the keel rabbet. Where the form at the lower part of the midship section is of a hollow character, or where thick garboards are fitted, the depth is measured from the point where the line of the flat of the bottom continued inwards cuts the side of the keel.

§ 43.15-10 Depth for freeboard (D).

(a) The depth used with the freeboard table is the molded depth plus the thickness of stringer plate, or plus

$$T(L-S)/L \tag{1}$$

if that be greater, where

T is the mean thickness of the exposed deck clear of deck openings, and

S is the total length of superstructures as defined in § 43.15-27.

(b) Where the topsides are of unusual form, *D* is the depth of a midship section having vertical topsides, standard round of beam, and area of topside section equal to that in the actual midship section. Where there is a step or break in the topsides (that is, as in the turret-deck vessel) 70 percent of the area above the step or break is included in the area used to determine the equivalent section.

(c) In a vessel without an enclosed superstructure covering at least 0.6L amidships, without a complete trunk or without a combination of intact partial superstructures and trunk extending all fore-and-aft, where *D* is less than L/15 the depth used when the table is not to be taken as less than L/15.

§ 43.15-15 Coefficient of fineness (c).

(a) The coefficient of fineness used with the freeboard table is given by

$$c=35\Delta/L.B.d_1 \tag{1}$$

where Δ is the vessel's molded displacement in tons (excluding bossing) at a mean molded draft d_1 which is 85 percent of the molded depth.

(b) The coefficient *c* is not to be taken as less than 0.68.

§ 43.15-17 Strength.

(a) The assigning authority is to be satisfied with the structural strength of vessels to which freeboards are assigned.

(b) Vessels which comply with the highest standard of the rules of a classification society recognized by the Commandant, U.S. Coast Guard, shall be regarded as having sufficient strength for the minimum freeboards allowed under the regulations in this part.

(c) Vessels which do not comply with the highest standard of the rules of a classification society recognized by the

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[3] The provisions of §§ 43.01-1—43.01-100, inclusive, and §§ 43.05-1—43.10-100, inclusive, apply to all vessels and for steamers, are further supplemented by §§ 43.15-1—43.15-98, inclusive. Steamers taking advantage of special classifications, such as tankers, steamers carrying timber deck cargo, lumber schooners, etc., are also subject to these requirements except as specifically modified in their separate classifications as set forth in the regulations.

Commandant, U.S. Coast Guard, shall be assigned such increased freeboards as shall be determined by the assigning authority, and for guidance the following strength moduli are formulated:

(1) *Material.* The strength moduli are based on the assumption that the structure is built of mild steel, manufactured by the open-hearth process (acid or basic), and having a tensile strength of 26 to 32 tons per square inch, and an elongation of at least 16 percent, on a length of 8 inches.

(2) *Strength deck.* The strength deck is the uppermost deck which is incorporated into and forms an integral part of the longitudinal girder within the half-length amidships.

(3) *Depth to strength deck (Ds).* The depth to strength deck is the vertical distance in feet amidships from the top of the keel to the top of the strength deck beam at side.

(4) *Draft* (*d*). The draft is the vertical distance in feet amidships from the top of the keel to the center of the disk.

(5) *Longitudinal modulus.* The longitudinal modulus I/y is the moment of inertia I of the midship section about the neutral axis divided by the distance y measured from the neutral axis to the top of the strength deck beam at side, calculated in way of openings but without deductions for rivet holes. Areas are measured in square inches and distances in feet.

(i) Below the strength deck, all continuous longitudinal members other than such parts of underdeck girders as are required entirely for supporting purposes are included. Above the strength deck, the gunwale angle bar and the extension of the sheerstrake are the only members included.

(ii) The required longitudinal modulus for effective material is expressed by *f. d. B.*, where f is the factor obtained from Table 43.15-17(c)(5)(ii).

(iii) For intermediate lengths, the value of f is determined by interpolation. This formula applies where L does not exceed 600 feet; B is between

$$(L/10)+5 \text{ and } (L/10)+20 \tag{1}$$

both inclusive, and L/Ds is between 10 and 13.5, both inclusive.

TABLE 43.15–17(c)(5)(ii)

L	f
100	1.80
120	2.00
140	2.35
160	2.70
180	3.15
200	3.60
220	4.20
240	4.80
260	5.45
280	6.20
300	6.95
320	7.70
340	8.55
360	9.40
380	10.30
400	11.20
420	12.15
440	13.10
460	14.15
480	15.15
500	16.25
520	17.35
540	18.45
560	19.60
580	20.80
600	22.00

(6) *Frame.* For the purpose of the frame modulus, the frame is regarded as composed of a frame angle and a reverse angle each of the same size and thickness.

(7) *Frame modulus.* The modulus I/y of the midship frame below the lowest tier of beams is the moment of inertia I of the frame section about the neutral axis divided by the distance y measured from the neutral axis to the extremity of the frame section, calculated without deduction for rivet and bolt holes. The modulus is measured in inch units.

(i) The required frame modulus is expressed by

$$[s(d-t)(f_1+f_2)]/1{,}000 \tag{2}$$

where:

s is the frame spacing in inches.

t is the vertical distance in feet measured at amidships from the top of the keel to a point midway between the top of the inner bottom at side and the top of the heel bracket (see fig. 43.15-17(c)(7)(i)); where there is no double bottom, t is measured to a point midway between the top of the floor at center and the top of the floor at side.

f_1 is a coefficient depending on H, which, in vessels fitted with double bottoms, is the vertical distance in feet from the middle of the beam bracket of the lowest tier of beams at side to a point midway between the top of the inner bottom at side and the top of the heel bracket (see fig. 43.15-17(c)(7)(i)); where there is no double bottom, H is measured to a point midway between the top of the floor at center and the top of the floor at side. Where the frame obtains additional strength from the form of the vessel, due allowance is made in the value of f_1.

f_2 is a coefficient depending on K, which is the vertical distance in feet from the top of the lowest tier of beams at side to a point 7 feet 6 inches above the freeboard deck at side, or, if there is a superstructure, to a point 12 feet 6 inches above the freeboard deck at side. (See fig. 43.15-17(c)(7)(i).) The values of f_1 and f_2 are obtained from Table 43.15-17(c)(7)(i).

(ii) This formula applies where D is between 15 feet and 60 feet, both inclusive, B is between $(L/10)+5$ and $(L/10)+20$, both inclusive, L/Ds is between 10 and 13.5, both inclusive, and the horizontal distance from the outside of the frame to the center of the first row of pillars does not exceed 20 feet.

(iii) In single-deck vessels of ordinary form where H does not exceed 18 feet, the frame modulus determined by the preceding method is multiplied by the factor f_3 where

$$f_3=0.05+0.05\,(H-8) \qquad (3)$$

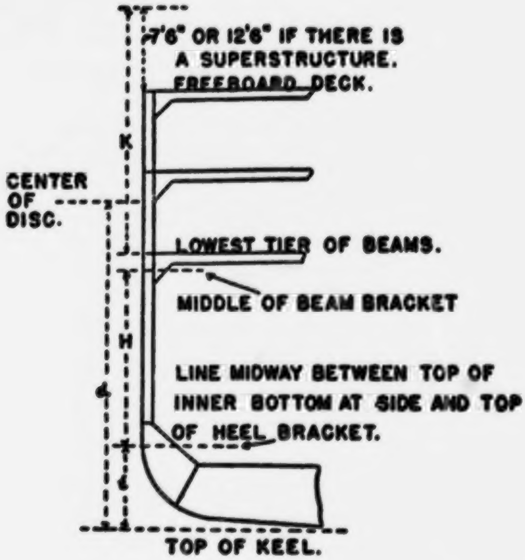
7'6" OR 12'6" IF THERE IS A SUPERSTRUCTURE.
FREEBOARD DECK.
K
CENTER OF DISC.
LOWEST TIER OF BEAMS.
MIDDLE OF BEAM BRACKET
H
LINE MIDWAY BETWEEN TOP OF INNER BOTTOM AT SIDE AND TOP OF HEEL BRACKET.
TOP OF KEEL.

FIGURE 43.15-17(c)(7)(i)

TABLE 43.15-17(c)(7)(i)

H in feet	0	7	9	11	13	15	17	19	21	23	25
f_1	9	11	12.5	15	19	24	29.5	36	43	51	59
K in feet	0	5	10	15	20	25	30	35	40	....	....
f_2	0	0.5	1.0	2.0	3.0	4.5	6.5	9.0	12.0	....	....

Intermediate values are obtained by interpolation.

(iv) Where the horizontal distance from the outside of the frame to the center of the first row of pillars exceeds 20 feet, the assigning authority is to be satisfied that sufficient additional strength is provided.

§ 43.15–20 Height of superstructure.

(a) The height of a superstructure is the least vertical height measured from the top of the superstructure deck to the top of the freeboard deck beams minus the difference between *D* and the molded depth. (See §§ 43.15–7, 43.15–10.)

§ 43.15–25 Standard height of superstructure.

(a) The standard height of a raised quarter-deck is 3 feet for vessels up to and including 100 feet in length, 4 feet for vessels 250 feet in length, and 6 feet for vessels 400 feet in length and above. The standard height of any other superstructure is 6 feet for vessels up to and including 250 feet in length and 7 feet 6 inches for vessels 400 feet in length and above. The standard height at intermediate lengths is obtained by interpolation.

§ 43.15–27 Length of superstructure (S).

(a) The length of a superstructure is the mean covered length of the parts of the superstructure which extends to the sides of the vessel and lie within lines drawn perpendicular to the extremities of the summer load waterline, as defined in § 43.15–1.

§ 43.15–30 Enclosed superstructure.

(a) A detached superstructure is regarded as inclosed only where:

(1) The enclosing bulkheads are of efficient construction. (See § 43.15–35).

(2) The access openings in these bulkheads are fitted with class 1 or class 2 closing appliances. (See §§ 43.15–37, 43.15–40.)

(3) All other openings in sides or ends of the superstructure are fitted with efficient weathertight means of closing.

(4) Independent means of access to crew, machinery, bunker, and other working spaces within bridges and poops are at all times available when the bulkhead openings are closed.

§ 43.15–35 Superstructure bulkheads.

(a) Bulkheads at exposed ends of poops, bridges, and forecastles are deemed to be of efficient construction where the assigning authority is satisfied that, in the circumstances, they are equivalent to the following standard for vessels with minimum freeboards under which standard the stiffeners and plating are of the scantings given in Table 43.15–35(a), the stiffeners are spaced 30 inches apart, the stiffeners on poop and bridge front bulkheads have efficient end connections, and those on after bulkheads of bridges and forecastles extend for the whole distance between the margin angles of the bulkheads.

TABLE 43.15–35(a)—EXPOSED BULKHEADS OF SUPERSTRUCTURES OF STANDARD HEIGHT

Bridge front bulkheads, unprotected bulkheads of poops 0.4*L* or more in length		Bulkheads of poops partially protected or less in length than 0.4*L*		After bulkheads of bridges and forecastles	
Length of vessel (feet)	Bulb angle stiffeners (inches)	Length of vessel (feet)	Plain angle stiffeners (inches)	Length of vessel (feet)	Plain angle stiffeners (inches)
Under 160	5½ by 3 by 0.30	Under 150	3 by 2½ by 0.30	Under 150	2½ by 2½ by 0.26.
160	6 by 3 by 0.32	150	3½ by 2½ by 0.32	150	3 by 2½ by 0.28.
200	6½ by 3 by 0.34	200	4 by 3 by 0.34	250	3½ by 3 by 0.30.
240	7 by 3 by 0.36	250	4½ by 3 by 0.36	350	4 by 3 by 0.32.
280	7½ by 3 by 0.38	300	5 by 3 by 0.38		
320	8 by 3 by 0.40	350	5½ by 3 by 0.42		
360	8½ by 3 by 0.42	400	6 by 3 by 0.44		
400	9 by 3 by 0.44	450	6½ by 3½ by 0.46		
440	9½ by 3½ by 0.46	500	7 by 3½ by 0.48		
480	10 by 3½ by 0.48	550	7 by 3½ by 0.50		
520	10½ by 3½ by 0.50.				

TABLE 43.15-35(a)—EXPOSED BULKHEADS OF SUPERSTRUCTURES OF STANDARD HEIGHT—Continued

Bridge front bulkheads, unprotected bulkheads of poops 0.4*L* or more in length		Bulkheads of poops partially protected or less in length than 0.4*L*		After bulkheads of bridges and forecastles	
Length of vessel (feet)	Bulb angle stiffeners (inches)	Length of vessel (feet)	Plain angle stiffeners (inches)	Length of vessel (feet)	Plain angle stiffeners (inches)
560	11 by 3½ by 0.52				

Length of vessel (feet)	Bulkhead plating[1] (feet)	Length of vessel (feet)	Bulkhead plating[1] (inch)	Length of vessel (feet)	Bulkhead plating[1] (inch)
200 and under	0.3	160 and under	0.24	160 and under	0.20
380 and above	.44	400 and above	.38	400 and above	.30

[1] For vessels intermediate in length the thicknesses of bulkhead plating are obtained by interpolation.

§ 43.15-37 Class 1 closing appliances.

(a) These appliances are of iron or steel, are in all cases to be permanently and strongly attached to the bulkhead, are framed, stiffened, and fitted so that the whole structure is of equivalent strength to the unpierced bulkhead, and are weathertight when closed. The means for securing these appliances are permanently attached to the bulkhead or to the appliances, and the latter are so arranged that they can be closed and secured from both sides of the bulkhead or from the deck above. The sills of the access openings are at least 15 inches above the deck.

§ 43.15-40 Class 2 closing appliances.

(a) These appliances are:

(1) Strongly framed hardwood hinged doors, which are not more than 30 inches wide nor less than 2 inches thick; or

(2) Shifting boards fitted for the full height of the opening in channels riveted to the bulkhead, the shifting boards being at least 2 inches thick where the width of opening is 30 inches or less, and increased in thickness at the rate of 1 inch for each additional 15 inches of width; or

(3) Portable plates of equal efficiency.

§ 43.15-43 Temporary closing appliances.

(a) Temporary closing appliances for middle line openings in the deck of an enclosed superstructure consist of

(1) A steel coaming not less than 9 inches in height efficiently riveted to the deck;

(2) Hatchway covers as required by § 43.10-15, secured by hemp lashings; and

(3) Hatchway supports as required by §§ 43.10-20, 43.10-25 and by Table 43.10-20(a1) or 43.10-20(a2).

§ 43.15-45 General, relative superstructures.

(a) Where exposed bulkheads of the ends of poops, bridges, and forecastles are not of efficient construction (see § 43.10-25), they are considered as nonexistent.

(b) Where in the side plating of a superstructure there is an opening not provided with permanent means of closing, the part of the superstructure in way of the opening is regarded as having no effective length.

(c) Where the height of a superstructure is less than the standard, its length is reduced in the ratio of the actual to the standard height. Where the height exceeds the standards, no increase is made in the length of the superstructure.

§ 43.15-47 Poop.

(a) Where there is an efficient bulkhead and the access openings are fitted with class 1 closing appliances (§ 43.15-37), the length to the bulkhead is effective. Where the access openings in an efficient bulkhead are fitted with class 2 closing appliances (§ 43.15-40) and the length to the bulkhead is 0.5*L* or less, 100 percent of that length is effective; where the length is 0.7*L* or more, 90 percent of that length is effective; where the length is between 0.5*L* and 0.7*L*, an intermediate percentage of that length is effective; where an allowance is given for an efficient adjacent trunk (see § 43.15-57), 90 percent of the length to the bulkhead is to be taken as effective; 50 percent of the length of an open poop or of an open extension beyond an efficient bulkhead is effective.

§ 43.15-50 Raised quarter-deck.

(a) Where there is an efficient intact bulkhead, the length to the bulkhead is effective. Where the bulkhead is not intact, the superstructure is considered as a poop of less than standard height.

§ 43.15-53 Bridge.

(a) Where there is an efficient bulkhead at each end, and the access openings in the bulkheads are fitted with class 1 closing appliances, the length between the bulkheads is effective.

(b) Where the access openings in the forward bulkhead are fitted with class 1 closing appliances and the access openings in the after bulkhead with class 2 closing appliances, the length between the bulkheads is effective; where an allowance is given for an efficient trunk, adjacent to the after bulkhead (see § 43.15-57), 90 percent of the length is effective. Where the access openings in both bulkheads are fitted with class 2 closing appliances, 90 percent of the length between the bulkheads is effective. Where the access openings in the forward bulkhead are fitted with class 1 or class 2 closing appliances and the access openings in the after bulkhead have no closing appliances, 75 percent of the length between the bulkheads is effective. Where the access openings in both bulkheads have no closing appliances, 50 percent of the length is effective; 75 percent of the length of an open extension beyond the after bulkhead and 50 percent of that beyond the forward bulkhead are effective.

CROSS REFERENCE: For class 1 and class 2 closing appliances, see §§ 43.15-37, 43.15-40.

§ 43.15-55 Forecastle.

(a) Where there is an efficient bulkhead and the access openings are fitted with class 1 or class 2 closing appliances, the length to the bulkhead is effective. Where no closing appliances are fitted and the sheer forward of amidships is not less than the standard sheer, 100 percent of the length of the forecastle forward of 0.1*L* from the forward perpendicular is effective; where the sheer forward is half the standard sheer or less, 50 percent of that length is effective; 50 percent of sheer forward is intermediate between the standard and half the standard sheer, an intermediate percentage of that length is effective; 50 percent of the length of an open extension beyond the bulkhead or beyond 0.1*L* from the forward perpendicular is effective.

CROSS REFERENCE: For class 1 and class 2 closing appliances, see §§ 43.15-37, 43.15-40.

§ 43.15-57 Trunk.

(a) A trunk or similar structure which does not extend to the sides of the vessel is regarded as efficient: *Provided*, That:

(1) The trunk is at least as strong as a superstructure.

(2) The hatchways are in the trunk deck, and comply with the requirements of §§ 43.10-1—43.10-45 and the width of the trunk deck stringer provides a satisfactory gangway and sufficient lateral stiffness.

(3) A permanent working platform fore and aft fitted with guardrails is provided by the trunk deck, or by detached trunks connected to other superstructures by efficient permanent gangways.

(4) Ventilators are protected by the trunk, by watertight covers or by equivalent means.

(5) Open rails are fitted on the weather portions of the freeboard deck in way of the trunk for at least half their length.

(6) The machinery casings are protected by the trunk, by a superstructure of standard height or by a deckhouse of the same height and of equivalent strength.

(b) Where access openings in poop and bridge bulkheads are fitted with class 1 closing appliances, 100 percent of the length of an efficient trunk reduced in the ratio of its mean breadth to *B* is added to the effective length of the superstructures. Where the access openings in these bulkheads are not fitted with class 1 closing appliances 90 percent is added.

(c) The standard height of a trunk is the standard height of a bridge.

(d) Where the height of the trunk is less than the standard height of a bridge, the addition is reduced in the ratio of the actual to the standard height; where the height of hatchway coamings on the trunk deck is less than the standard height of coamings (see § 43.10-10), a reduction from the actual height of trunk is to be made which corresponds to the difference between the actual and the standard height of coamings.

§ 43.15-60 Enclosed superstructure with middle line openings in the deck not provided with permanent means of closing.

(a) Where there is an enclosed superstructure with one or more middle line openings in the deck not provided with permanent means of closing (see §§ 43.-10-1—43.10-45), the effective length of the superstructure is determinated as follows:

(1) Where efficient temporary closing appliances are not provided for the middle line deck openings (see § 43.15-43), or the breadth of openings is 80 percent or more of the breadth B_1 of the superstructure deck at the middle of the opening, the vessel is considered as having an open well in way of each opening, and freeing ports are to be provided in way of this well. The effective length of superstructure between openings is governed by §§ 43.15-47, 43.15-53, 43.15-55.

(2) Where efficient temporary closing appliances are provided for middle line deck openings, and the breadth of openings is less than $0.8B_1$ the effective length is governed by §§ 43.15-47, 43.15-53, 43.15-55, except that where access openings in between deck bulkheads are closed by class 2 closing appliances, they are regarded as being closed by class 1 closing appliances in determining the effective length. The total effective length is obtained by adding to the length determined by paragraph (a)(1) of this section the difference between this length and the length of the vessel modified in the ratio of

$(B_1—b)/B_1$where b=*breadth of deck opening*

where

$(B_1—b)/B_1$ is greater than 0.5, it is taken as 0.5

§ 43.15-63 Deductions for superstructures.

(a) Where the effective length of superstructures is $1.0L$, the deduction from the freeboard is 14 inches at 80 feet length of vessels, 34 inches at 280 feet length, and 42 inches at 400 feet length and above; deductions at intermediate lengths are obtained by interpolation. Where the total effective length of superstructures is less than $1.0L$ the deduction is a percentage obtained from Table 43.15-63(a):

TABLE 43.15-63(a)—TOTAL EFFECTIVE LENGTH OF SUPERSTRUCTURES (E)

Superstructures	0 percent	$0.1L$ percent	$0.2L$ percent	$0.3L$ percent	$0.4L$ percent	$0.5L$ percent	$0.6L$ percent	$0.7L$ percent	$0.8L$ percent	$0.9L$ percent	$1.0L$ percent	Line
All types with forecastle and without detached bridge	0	5	10	15	23.5	32	46	63	75.3	87.7	100	A
All types with forecastle and detached bridge[1]	0	6.3	12.7	19	27.5	36	46	63	75.3	87.7	100	B

[1] Where the effective length of a detached bridge is less than $0.2L$ the percentages are obtained by interpolation between lines B and A. Where no forecastle is fitted the above percentages are reduced by 5. Percentages for intermediate lengths of superstructures are obtained by interpolation.

§ 43.15–65 Sheer, general.

(a) The sheer is measured from the deck at side to a line of reference drawn parallel to the keel through the sheer line at amidships.

(b) In vessels designed to trim by the stern in service, the sheer may be measured in relation to the load line, provided an additional mark is placed at 0.25L forward of amidships to indicate the assigned load line. This mark is to be similar to the load line disk amidships.

(c) In flush deck vessels and in vessels with detached superstructures the sheer is measured at the freeboard deck.

(d) In vessels with topsides of unusual form in which there is a step or break in the topsides, the sheer is considered in relation to the equivalent depth amidships. (See § 43.15–15).

(e) In vessels with a superstructure of standard height which extends over the whole length of the freeboard deck, the sheer is measured at the superstructure deck; where the height exceeds the standard, the sheer may be considered in relation to the standard height.

(f) Where a superstructure is intact or access openings in its inclosing bulkheads are fitted with class 1 closing appliances (§ 43.15–37), and the superstructure deck has at least the same sheer as the exposed freeboard deck, the sheer of the enclosed portion of the freeboard deck is not taken into account.

§ 43.15–67 Standard sheer profile.

(a) The ordinates (in inches) of the standard sheer profile are given in Table 43.15–67(a), where L is the number of feet in the length of the vessel.

TABLE 43.15–67(a)

Station	Ordinate	Factor
A. P[1]	0.1 L+10	1
⅙ L from A. P	.0445L+4.45	4
⅓ L from A. P	.011 L+1.1	2
Amidships	0	4
⅓ L from F. P.[2]	.022 L+2.2	2
⅙ L from F. P	.089 L+8.9	4
F. P	.2 L+20	1

[1] A. P.+After end of summer load waterline.

[2] F. P.+Fore end of summer load waterline.

§ 43.15–70 Measurement of variations from standard sheer profile.

(a) Where the sheer profile differs from the standard, the 7 ordinates of each profile are multiplied by the appropriate factors given in the table of ordinates. The difference between the sums of the respective products, divided by 18, measures the deficiency or excess of sheer. Where the after half of the sheer profile is greater than the standard and the forward half is less than the standard, no credit is allowed for the part in excess and the deficiency only is measured.

(b) Where the forward half of the sheer profile exceeds the standard, and the after portion of the sheer profile is not less than 75 percent of the standard, credit is allowed for the part in excess; where the after part is less than 50 percent of the standard no credit is given for the excess sheer forward. Where the after sheer is between 50 percent and 75 percent of the standard, intermediate allowances may be granted for excess sheer forward.

§ 43.15–73 Correction for variations from standard sheer profile.

(a) The correction for sheer is the deficiency or excess of sheer (see § 43.15–70(a)) multiplied by 0.75-(S/2L) where S is the total length of superstructure, as defined in § 43.15–27.

§ 43.15–75 Addition for deficiency in sheer.

Where the sheer is less than the standard, the correction for deficiency in sheer (see § 43.15–73) is added to the freeboard.

§ 43.15–77 Deduction for excess sheer.

(a) In flush deck vessels and in vessels where an enclosed superstructure covers 0.1 L before and 0.1 L abaft amidships, the correction for excess of sheer (see § 43.15–73) is deducted from the freeboard; in vessels with detached superstructures where no enclosed superstructure covers amidships, no deduction is made from the freeboard; where an enclosed superstructure covers less than 0.1 L before and 0.1 L abaft amidships, the deduction is obtained by interpolation. The maximum deduction for excess sheer is 1½ inches at 100 feet and increases at the rate of 1½ inches for each additional 100 feet in the length of the vessel.

§ 43.15-80 Standard round of beam.

(a) The standard round of beam of the freeboard deck is one-fiftieth of the breadth of the vessel.

§ 43.15-83 Round of beam correction.

(a) Where the round of beam of the freeboard deck is greater or less than the standard, the freeboard is decreased or increased respectively by one-fourth of the difference between the actual and the standard round of beam, multiplied by the proportion of the length of the freeboard deck not covered by enclosed superstructures. Twice the standard round of beam is the maximum for which allowance is given.

§ 43.15-85 Summer freeboard.

(a) The minimum freeboard in summer is the freeboard derived from the freeboard table after corrections for departures from the standards and after deduction for superstructures. The freeboard in salt water measured from the intersection of the upper surface of the freeboard deck with the outer surface of the shell is not to be less than 2 inches.

§ 43.15-87 Tropical freeboard.

(a) Except as provided in paragraph (b) of this section, the minimum freeboard in the tropical zone is the freeboard obtained by a deduction from the summer freeboard of one-fourth inch per foot of summer draft measured from the top of the keel to the center of the disk. The freeboard in salt water measured from the intersection of the upper surface of the freeboard deck with the outer surface of the shell is not to be less than 2 inches.

(b) For vessels 400 feet and above in length engaged in coastwise voyages, the area on the west coast of the United States eastward of a rhumb line from the point 30° N. latitude, 12° W. longitude to the point 33° N. latitude, 123° W. longitude, and a line thence along the meridian 123° W. longitude to its intersection with land at 38° N. latitude shall be considered an extension of the seasonal tropical zone as defined in § 43.40-1(f)(5)(ii), and the minimum freeboard is determined as in paragraph (a) of this section. For vessels above 300 feet and up to 400 feet in length engaged in coastwise voyages the minimum freeboard in this area during the tropical seasons is the freeboard obtained by deduction from the summer freeboard of (L/400)−0.75 inch per foot of summer draft, and it shall be noted on the coastwise load line certificate when this provision has been applied. The freeboard in salt water measured from the intersection of the upper surface of the freeboard deck with the outer surface of the shell is not to be less than 2 inches.

§ 43.15-90 Winter freeboard.

(a) Except as provided in paragraph (b) of this section, the minimum freeboard in winter is the freeboard obtained by an addition to the summer freeboard of one-fourth inch per foot of summer draft, measured from the top of the keel to the center of the disk.

(b) For vessels 400 feet and above in length engaged in coastwise voyages, the area on the east coast of the United States west of a line drawn south along the meridian at 68°30′ W. longitude from where it intersects the coast to 40° N. latitude, thence along a rhumb line to the point 36° N. latitude, 73° W. longitude shall be considered an extension of the summer zone and the minimum freeboard shall be the summer freeboard. For vessels above 300 feet and up to 400 feet in length engaged in coastwise voyages the minimum freeboard, when in this area, in winter, is the freeboard obtained by an addition to the summer freeboard of 1.00−(L/400) inch per foot of summer draft, and it shall be noted on the coastwise load line certificate when this provision has been applied.

§ 43.15-93 Winter North Atlantic freeboard.

(a) The minimum freeboard for vessels not exceeding 330 feet in length on voyages across the North Atlantic from a port or place of departure north of latitude 36° N. to a port or place of arrival north of latitude 36° N., regardless of the route of the vessel while it is in either of the northern seasonal winter zones during the winter season, shall be the winter freeboard plus 2 inches. For vessels over 330 feet in length it is the winter freeboard.

§ 43.15–95 Fresh-water freeboard.

(a) The minimum freeboard in fresh water of unit density is the freeboard obtained by deducting from the minimum freeboard in salt water $\Delta/40T$ inches, where

Δ=displacement in salt water in tons at the summer load waterline, and
T=tons per inch immersion in salt water at the summer load waterline.

(b) Where the displacement at the summer load waterline cannot be certified, the deduction is to be one-fourth inch per foot of summer draft, measured from the top of the keel to the center of the disk.

§ 43.15–97 Freeboard table for steamers.

(a) Table 43.15–97(a) gives the basic minimum summer freeboard for steamers which comply with the standards in this part.

TABLE 43.15–97(a)—BASIC MINIMUM SUMMER FREEBOARD FOR STEAMERS

L (feet)	Freeboard (inches)
80	8.0
90	9.0
100	10.0
110	11.0
120	12.0
130	13.0
140	14.2
150	15.5
160	16.9
170	18.3
180	19.8
190	21.4
200	23.1
210	24.8
220	26.6
230	28.5
240	30.3
250	32.3
260	34.4
270	36.5
280	38.7
290	41.0
300	43.4
310	45.9
320	48.4
330	51.0
340	53.7
350	56.5
360	59.4
370	62.4
380	65.4
390	68.4
400	71.5
410	74.6
420	77.8
430	80.9
440	84.0
450	87.1
460	90.2
470	93.3
480	96.3
490	99.3
500	102.3
510	105.2
520	108.1
530	110.9
540	113.7
550	116.4
560	119.1
570	121.8
580	124.4
590	127.0
600	129.5
610	132.0
620	134.4
630	136.8
640	139.1
650	141.4
660	143.7
670	145.9
680	148.1
690	150.2
700	152.3
710	154.4
720	156.4
730	158.5
740	160.5
750	162.5
760	164.4
770	166.3
780	168.2
790	170.1
800	172.0
810	173.8
820	175.6
830	177.4
840	179.2
850	180.9
860	182.6
870	184.3
880	186.0
890	187.7
900	189.3
910	190.9
920	192.5
930	194.1
940	195.7
950	197.3
960	198.9
970	200.4

TABLE 43.15-97(a)—BASIC MINIMUM SUMMER FREEBOARD FOR STEAMERS—Continued

L (feet)	Freeboard (inches)
980	201.9
990	203.4
1,000	204.9
(1)	(1)

(1) Vessels above 1,000 feet are to be dealt with by the administration.

(b) The minimum freeboards for flush deck steamers are obtained by an addition to Table 43.15-97 (a) at the rate of 1½ inches for every 100 feet of length.

(c) The freeboards at intermediate lengths are obtained by interpolation.

(d) Where c exceeds 0.68, the freeboard is multiplied by the factor

$$(c+0.68)/1.36 \qquad (1)$$

(e) Where D exceeds $L/15$ the freeboard is increased by $D\text{-}(L/15)\ R$ inches, where R is $L/130$ at lengths less than 390 feet, and 3 at 390 feet length and above.

(1) In a vessel with an enclosed superstructure covering at least $0.6L$ admidships with a complete trunk or with a combination of intact partial superstructures and trunk which extends all fore and aft, where D is less than $L/15$ the freeboard is reduced at the above rate.

(2) Where the height of superstructures or trunk is less than the standard height, the reduction is in the ratio of the actual to the standard height.

(f) Where the actual depth to the surface of the freeboard deck amidships is greater or less than D, the difference between the depths (in inches) is added to or deducted from the freeboard.

§ 43.15-98 Reduced freeboards for steamers having superior design and operational features, and engaged on United States coastwise and/or intercoastal voyages.

(a) Subject to compliance with the additional conditions in paragraph (b) of this section but otherwise in accordance with the usual conditions of assignment, the freeboards of steamers over 370 feet in length, engaged in U.S. coastwise and/or intercoastal voyages, may be computed from the lesser tabular values given by the Table 43.15-98(a) in lieu of those given by Table 43.15-97(a).

(b) In order to be eligible for the reduced freeboards permitted by this section, vessels shall comply with the following supplementary conditions:

(1) Weather deck hatch covers shall be of steel construction, sealed watertight, without need for tarpaulins, as provided by § 43.10-5(b). Associated hatch coamings shall be at least of standard height, as provided by § 43.10-10.

(2) Vessels shall be fitted with forecastles having an efficient bulkhead with effective Class 1 or Class 2 closing appliances. Forecastles of standard height or greater shall extend for at least 0.07L. If a forecastle is of less than standard height, but not less than 5.5 feet in height, the product of its length and height, in feet squared, shall be at least equal to 0.50L+50 times the deficiency in height in feet. Forecastles may not be less than 5.5 feet in height for credit under this paragraph (b)(2).

(3) Alternatively, vessels not having creditable forecastles but having sufficient excess sheer forward, are eligible for these reduced freeboards. For this purpose the sheer in inches at ⅙L from the forward perpendicular shall be at least 0.089L+8.9+⅙ times the difference between the tabular freeboard obtained from Table 43.15-97(a) and that obtained from Table 43.15-98(a). Similarly, the sheer at the forward perpendicular shall be at least 0.2L+20 plus the difference between the tabular freeboards obtained from Tables 43.15-97(a) and 43.15-98(a).

TABLE 43.15-98(a)—REDUCED BASIC MINIMUM SUMMER FREEBOARDS FOR STEAMERS ON UNITED STATES COASTWISE AND/OR INTERCOASTAL VOYAGES

L (feet)	Freeboard inches
470	62.4
480	64.8
490	67.2

TABLE 43.15-98(a)—REDUCED BASIC MINIMUM SUMMER FREEBOARDS FOR STEAMERS ON UNITED STATES COASTWISE AND/OR INTERCOASTAL VOYAGES—Continued

L (feet)	Freeboard inches
500	69.6
310	72.0
720	74.5
430	77.1
440	79.7
450	82.3
430	84.9
044	87.5
680	90.0
490	92.5
500	95.0
310	97.5
520	99.9
530	102.3
540	104.7
550	107.0
560	109.3
570	111.5
580	113.7
590	115.9
600	118.0
610	120.1
620	122.1
630	124.1
640	126.1
650	128.1
660	130.0
670	131.8
680	133.6
690	135.4
700	137.1
710	138.8
720	140.5
730	142.2
740	143.8
750	145.4
760	146.9
770	148.4
780	149.9
790	151.4
800	152.8
810	154.2
820	155.6
830	157.0
840	158.3
850	159.6
860	160.9
870	162.2
880	163.5
890	164.8
900	166.1
910	167.3
920	168.5
930	169.7
940	170.9
950	172.1
960	173.3
970	174.4
980	175.5
990	176.6
1000	177.6
(1)	(1)

[1] Vessels above 1,000 feet are to be dealt with by the administration.

(4) Vessels shall be subdivided and shall be operated with sufficient stability to maintain a one compartment standard of watertight subdivision and damage stability at drafts up to and including the resulting load draft. For determining compliance with this requirement, the specific standards laid down in Parts 73 and 74 of Subchapter H (Passenger Vessels) of this chapter, as they apply to a required factor of subdivision of 1.0, shall be used, with the exception however, that the cargo space permeabilities specified by §§ 73.10-5(c) and 74.10-15(c) of this chapter shall be suitably increased when the vessel is particularly engaged in the carriage of cargoes which result in a higher value. The related plans, calculations and data, including the stability instructions called for by Subpart 74.20, shall be submitted to the Commandant (MMT), who will then advise the American Bureau of Shipping, or other authorized assigning authority, as to the final acceptability of the subdivision at the proposed draft.

(5) Vessels shall be structurally suitable for the resulting load draft.

(c) The provisions of this section shall be applicable only to freeboard assignments made to U.S.-flag vessels engaged on coastwise and/or intercoastal voyages prior to January 6, 1967.

[CGFR 65-50, 30 FR 16730, Dec. 30, 1965, as amended by CGFR 68-60, 33 FR 10076, July 12, 1968]

Subpart 43.20—Load Lines for Sailing Vessels[4]

§ 43.20-1 Lines to be used on sailing vessels in connection with the disk.

(a) Winter and tropical load lines are not marked on sailing vessels. The maximum load lines to which sailing vessels may be laden in salt water in winter and in the tropical zone is the center of the disk. (See fig. 43.20-1(a).)

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[4] The provisions of §§ 43.01-1—43.01-100 and 43.05-1—43.15-97, inclusive, apply to sailing vessels, except as modified by §§ 43.20-1—43.20-45, inclusive.

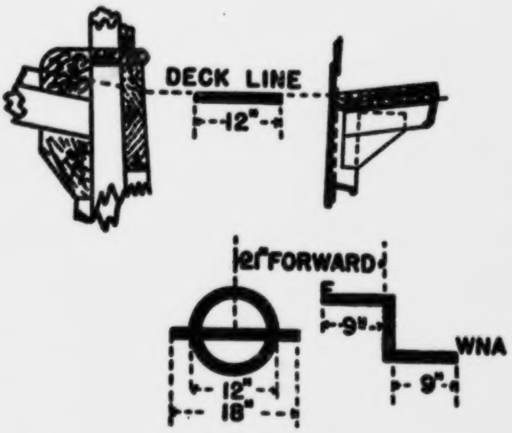

FIGURE 43.20-1 (a)

§ 43.20-5 Conditions of assignment of sailing vessel load lines.

(a) The conditions of assignment for sailing vessels are those contained in §§ 43.10-1—43.10-100.

§ 43.20-10 Computation of freeboard, sailing vessels.

(a) Freeboards are computed from the freeboard table for sailing vessels in the same manner as the freeboards for steamers are computed from the freeboard table for steamers, except as provided by §§ 43.20-15—43.20-45.

§ 43.20-15 Depth for freeboard, sailing vessels (D).

(a) In sailing vessels having a greater rate of rise of floor than 1½ inches per foot, the vertical distance from the top of keel (§ 43.15-7) is reduced by half the difference between the total rise of floor at the half breadth of the vessel and the total rise of 1½ inches per foot; 2½ inches per foot of half breadth is the maximum rate of rise for which a deduction is made.

(b) Where the form at the lower part of the midship section is of a hollow character, or thick garboards are fitted, the depth is measured from the point where the line of the flat of the bottom continued inwards cuts the side of the keel.

(c) The depth used with the freeboard table is to be taken as not less than *L*/12.

§ 43.20-20 Coefficient of fineness, sailing vessels (c).

(a) The coefficient used with the freeboard table for sailing vessels is to be taken as not less than 0.62 and not greater than 0.72.

§ 43.20-25 Superstructures in wood sailing vessels.

(a) In wood sailing vessels the construction and closing arrangements of superstructures for which deductions are made from the freeboard are to be to the satisfaction of the assigning authority.

§ 43.20-30 Deductions for sailing vessel superstructures.

(a) Where the effective length of superstructures on sailing vessels is 1.0*L*, the deduction from the freeboard is 3 inches at 80 feet length of vessel, and 28 inches at 80 feet length of vessel, and 28 inches at 330 feet length and above; deductions in intermediate lengths are obtained by interpolation. Where the total effective length of superstructures is less than 1.0*L*, the deduction is a percentage obtained from Table 43.20-30 (a).

TABLE 43.20-30 (a)—TOTAL EFFECTIVE LENGTH OF SUPERSTRUCTURES (E)

Type of superstructures	0 percent	0.1*L* percent	0.2*L* percent	0.3*L* percent	0.4*L* percent	0.5*L* percent	0.6*L* percent	0.7*L* percent	0.8*L* percent	0.9*L* percent	1.0*L* percent	Line
All types without bridge...	0	7	13	17	23.5	30	47½	70	80	90	100	A
All types with bridge [1]......	0	7	14.7	22	32	42	56	70	80	90	00	B

[1] Where the effective length of bridge is less than 0.2*L*, the percentages are obtained by interpolation between lines B and A. Percentages for intermediate lengths of superstructures are obtained by interpolation.

§ 43.20-35 Minimum freeboards for sailing vessels.

(a) No addition to the freeboard is required for winter freeboard, nor is a deduction permitted for tropical freeboard.

(b) An increase in freeboard of 3 inches is made for voyages across the North Atlantic north of latitude 36° N. during the winter months.

(c) In computing the fresh water freeboard for a wood vessel, the draft is measured from the lower edge of the rabbet of keel to the center of the disk.

§ 43.20-40 Freeboard table for sailing vessels.

(a) Table 43.20-40(a) gives the basic minimum summer, winter, and tropical freeboards for iron and steel flush deck sailing vessels, which comply with the standards in this part.

TABLE 43.20-40(a)—MINIMUM SUMMER, WINTER, AND TROPICAL FREEBOARDS FOR IRON AND STEEL FLUSH DECK SAILING VESSELS

L (feet)	Freeboard inches
80	9.2
90	11.0
100	12.9
110	14.9
120	17.0
130	19.1
140	21.3
150	23.5
160	25.8
170	28.2
180	30.6
190	33.0
200	35.4
210	37.9
220	40.4
230	42.9
240	45.5
250	48.1
260	50.8
270	53.5
280	56.3
290	59.1
300	61.9
310	64.7
320	67.6
330	70.5

(b) The freeboards at intermediate lengths are obtained by interpolation.

(c) Where c exceeds 0.62 the freeboard is multiplied by the factor

$$(c+0.62)/1.24 \qquad (1)$$

(d) Where D exceeds $L/12$ the freeboard is increased by

$$[D-(L/12)][1+(L/250)\text{ inches}] \qquad (2)$$

(e) Where the actual depth to the surface of the freeboard deck amidships is greater or less than D, the difference between the depths (in inches) is added to or deducted from the freeboard.

§ 43.20-45 Freeboard for wood sailing vessels.

(a) The freeboard for a wood sailing vessel is the final freeboard the vessel would obtain if she were of iron or steel, with the addition of such penalties as the assigning authority may determine, having regard to the classification, construction, age, and condition of the vessel.

Subpart 43.25—Load Lines for Steamers Carrying Timber Deck Cargoes[5]

§ 43.25-1 Definitions.

(a) *Timber deck cargo.* The term "timber deck cargo" means a cargo of timber carried on an uncovered part of a freeboard or superstructure deck. The term does not include wood pulp or similar cargo.

(b) *Timber load line.* A timber load line is a special load line to be used only when the vessel is carrying a timber deck cargo in compliance with the requirements in this subpart.

§ 43.25-5 Marks on the vessel's sides; timber cargo; timber load lines.

(a) The lines which indicate the maximum timber load lines in different circumstances and at different seasons are to be horizontal lines, 9 inches in length and 1 inch in breadth, which extend from and are at right angles to, a vertical line marked 21 inches abaft the center of the disk.

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[5] The provisions of §§ 43.01-1—43.01-100, inclusive, and §§ 43.05-1—43.15-97, inclusive, also apply to steamers marked to carry timber deck cargoes except as they are modified by §§ 43.25-1—43.30-5, inclusive.

(See fig. 43.25-5(a).) They are to be marked and verified similarly to the ordinary load lines. (See §§ 43.05-20—43.05-30.)

(b) The summer timber load line is indicated by the upper edge of a line marked *"LS."*

(c) The winter timber load line is indicated by the upper edge of a line marked *"LW."*

(d) The winter North Atlantic timber load line is indicated by the upper edge of a line marked *"LWNA."*

(e) The tropical timber load line is indicated by the upper edge of a line marked *"LT."*

(f) The fresh water timber load line in summer is indicated by the upper edge of a line marked *"LF."* The difference between the fresh water timber load line in summer and the summer timber load line is the allowance to be made for loading in fresh water at the other timber load lines. The fresh water timber load line in the tropical zone is indicated by the upper edge of a line marked *"LTF."*[6]

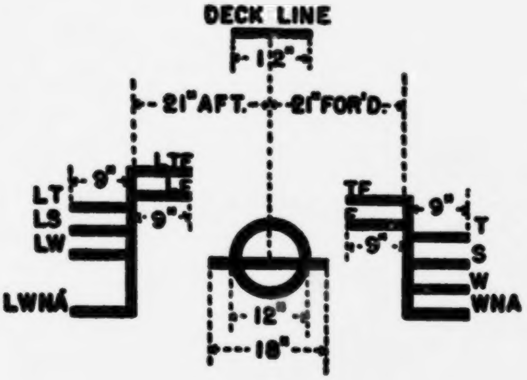

FIGURE 43.25-5(a)

§ 43.25-10 Construction of vessel; timber cargo.

(a) The structure of the vessel is to be of sufficient strength for the deeper draft allowed and for the weight of the deck cargo.

§ 43.25-15 Superstructures; timber cargo.

(a) The vessel is to have a forecastle of at least standard height and at least 7 percent of the length of the vessel, and, in addition, a poop, or a raised quarter deck with a strong steel hood or deckhouse fitted aft.

§ 43.25-20 Machinery casings; timber cargo.

(a) Machinery casings on the freeboard deck are to be protected by a superstructure of at least standard height, unless the machinery casings are of sufficient strength and height to permit the carriage of timber alongside.

§ 43.25-25 Double bottom tanks; timber cargo.

(a) Double bottom tanks where fitted within the midship half length of the vessel are to have adequate longitudinal subdivision.

§ 43.25-30 Bulwarks; timber cargo.

(a) The vessel must be fitted either with permanent bulwarks at least 3 feet 3 inches high, specially stiffened on the upper edge and supported by strong bulwark stays attached to the deck in the way of the beams and provided with necessary freeing ports or with efficient rails of the same height as the above and of specially strong construction.

§ 43.25-35 Deck openings covered by timber deck cargo.

(a) Openings to spaces below the freeboard deck are to be securely closed and battened down. All fittings, such as hatchway beams fore-and-afters, and covers are to be in place. Where hold ventilation is needed, the ventilators are to be efficiently protected.

§ 43.25-40 Stowage; timber cargo.

(a) The wells on the freeboard deck are to be filled with timber stowed as solidly as possible, to at least the standard height of a bridge.

(b) On a vessel within a seasonal winter zone in winter, the height of the deck cargo above the freeboard deck is not to exceed one-third of the extreme breadth of the vessel.

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[6] Where seagoing steamers navigate a river or inland water, deeper loading is permitted corresponding to the weight of fuel, etc., required for consumption between the point of departure and the open sea.

(c) All timber deck cargo is to be compactly stowed, lashed, and secured. It must not interfere in any way with the navigation and necessary work of the vessel, or with the provision of a safe margin of stability at all stages of the voyage, regard being given to additions of weight, such as those due to absorption of water and to losses of weight such as those due to consumption of fuel and stores.

§ 43.25-45 Protection of crew, access to machinery space; timber cargo.

(a) Safe and satisfactory access to the quarters of the crew, to the machinery space, and to all other parts used in the necessary work of the vessel is to be available at all times. Deck cargo in way of openings which give access to such parts is to be so stowed that the openings can be properly closed and secured against the admission of water. Efficient protection for the crew in the form of guardrails, or lifelines, spaced not more than 12 inches apart vertically, is to be provided on each side of the deck cargo to a height of at least 4 feet above the cargo. The cargo is to be made sufficiently level for gangway purposes.

§ 43.25-50 Steering arrangements; timber cargo.

(a) Steering arrangements are to be effectively protected from damage by cargo and, as far as practicable, are to be accessible. Efficient provision is to be made for steering in the event of a breakdown in the main steering arrangements.

§ 43.25-55 Uprights; timber cargo.

(a) Uprights, when required by the nature of the timber, are to be of adequate strength and may be of wood or metal; the spacing is to be suitable for the length and character of timber carried, but is not to exceed 10 feet. Strong angles or metal sockets efficiently secured to the stringer plate or equally efficient means are to be provided for securing the uprights.

§ 43.25-60 Lashings; timber cargo.

(a) Timber deck cargo is to be efficiently secured through its length by independent overall lashings spaced not more than 10 feet apart.

(b) Eye plates for these lashings are to be riveted to the sheer strake at intervals of not more than 10 feet, the distance from an end bulkhead of a superstructure to the first eye plate being not more than 6 feet 6 inches. Additional eye plates may be fitted on the stringer plate.

(c) Overall lashings are to be in good condition and are to be not less than three-fourths inch close link chain or flexible wire rope of equivalent strength, fitted with sliphooks and stretching screws, which are to be accessible at all times. Wire rope lashings are to have a short length of long link chain to permit the length of lashings to be regulated.

(d) When timber is in lengths less than 12 feet, the spacing of the lashings is to be reduced to suit the length of timber or other suitable provision made.

(e) When the spacing of the lashings is 5 feet or less, the size of the lashing may be reduced, but not less than one-half inch chain or equivalent wire rope is to be used.

(f) All fittings required for securing the lashings are to be of strength corresponding to the strength of the lashings.

(g) On superstructure decks, uprights, where fitted, are to be about 10 feet apart and are to be secured by athwartship lashings of ample strength.

§ 43.25-65 Plans; timber cargo.

(a) Plans showing the fittings and arrangements for stowing and securing timber deck cargoes in compliance with the foregoing conditions and §§ 43.25-1—43.25-60 are to be submitted to the assigning authority.

§ 43.25-70 Computation of freeboard; timber cargo.

(a) Where the assigning authority is satisfied that the vessel is suitable and that the conditions and arrangements are at least equal to the foregoing requirements for the carriage of timber deck cargo, the summer freeboards computed in accordance with the rules and tables in §§ 43.15-1—43.15-97, may be modified to give special timber freeboards by substituting the following percentages for those in § 43.15-63:

TABLE 43.25-70(a)—TOTAL EFFECTIVE LENGTH OF SUPERSTRUCTURES

[Percent]

	0	0.1*L*	0.2*L*	0.3*L*	0.4*L*	0.5*L*	0.6*L*	0.7*L*	0.8*L*	0.9*L*	1.0*L*
All types	20	30.75	41.5	52.25	63	69.25	75.5	81.5	87.5	93.75	100

(b) The winter timber freeboard is to be obtained by adding to the summer timber freeboard one-third of an inch per foot of the molded summer timber draft.

(c) The winter North Atlantic timber freeboards are the winter North Atlantic freeboards prescribed in § 43.15-93.

(d) The tropical timber freeboard is to be obtained by deducting from the summer timber freeboard one-quarter of an inch per foot of the molded summer timber draft.

CROSS REFERENCE: For requirements for the carriage of timber deck cargo, see §§ 43.25-1—43.25-65.

Subpart 43.30—Load Lines for Tankers[7]

NOTE: The term "tanker" includes all steamers specially constructed for the carriage of liquid cargoes in bulk.

§ 43.30-1 Tanker load line markings.

(a) Tankers assigned load lines computed in accordance with Table 43.30-70(a) (valid for both United States' domestic and international voyages) shall be marked as provided by §§ 43.05-5 to 43.05-30, inclusive, and as shown in Figure 43.05-5(a).

(b) Tankers assigned load lines computed in accordance with Table 43.30-75(a) (valid only for United States coastwise and/or intercoastal voyages) shall be marked abaft the disk as shown in Figure 43.05-15(d).

(c) Tankers marked in accordance with paragraph (b) of this section but which may also engage in foreign voyages may carry both the markings called for by paragraphs (a) and (b) of this section when on United States coastwise and/or intercoastal voyages, except that, in such cases, the line through the center of the disk shall correspond to the summer load line computed in accordance with Table 43.30-70(a). Tankers departing on foreign voyages shall only bear the marks forward of the disk called for by paragraph (a) of this section.

§ 43.30-5 Construction of tanker.

(a) The structure of the vessel is to be of sufficient strength for the increased draft corresponding to the freeboard assigned.

§ 43.30-10 Forecastle; tanker.

(a) The vessel is to have a forecastle of which the length is not less than 7 percent of the length of the vessel and the height is not less than the standard height.

§ 43.30-15 Machinery casings; tanker.

(a) The openings in machinery casings on the freeboard deck are to be fitted with steel doors. The casings are to be projected by an enclosed poop or bridge of at least standard height or by a deckhouse of equal height and of equivalent strength. The bulkheads at the ends of these structures are to be of the scantlings required for bridge front bulkheads. All entrances to the structures from the freeboard deck are to be fitted with effective closing appliances and the sills are to be at least 18 inches above the deck. Exposed machinery casings on the superstructure deck are to be of substantial construction, and all openings in them are to be fitted with steel closing appliances permanently attached to the casings and capable of being closed and secured from both sides; the sills of such openings are to be at least 15 inches above the deck. Fiddley openings are to be as high above the superstructure deck as is reasonable and practicable and are to have strong steel covers permanently attached in their proper positions.

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[7] The provisions of §§ 43.01-1—43.01-100, inclusive, and §§ 43.05-1—43.05-97, inclusive also apply to tankers except as they are modified by §§ 43.30-1—43.30-70, inclusive.

§ 43.30–20 Gangway; tanker.

(a) An efficiently constructed permanent gangway of sufficient strength for its exposed position is to be fitted fore and aft at the level of the superstructure deck between the poop and midship bridge, and when crew are berthed forward, from the bridge to the forecastle, or other equivalent means of access may be provided to carry out the purpose of the gangway, such as passages below deck.

§ 43.30–25 Protection of crew; access to machinery space; tanker.

(a) Safe and satisfactory access from the gangway level to the quarters of the crew, the machinery space, and all other parts used in the necessary work of the vessel is to be available at all times. This section does not apply to pumprooms entered from the freeboard deck, when fitted with class 1 closing appliances.

Cross Reference: For class 1 closing appliances, see § 43.15–37.

§ 43.30–30 Hatchways; tanker.

(a) All exposed hatchways on the freeboard deck and on the deck of expansion trunks are to be closed watertight by efficient steel covers. Hatchways on the freeboard deck within a forecastle which is closed at the after end with a bulkhead and closing appliances no less effective than Class 2 may be fitted with wood covers, coamings, and closing appliances in accordance with § 43.10–55, provided hatchways on the forecastle deck are closed watertight by efficient steel covers.

§ 43.30–35 Ventilators; tanker.

(a) Ventilators to spaces below the freeboard deck are to be of ample strength or are to be protected by superstructures or equally efficient means.

§ 43.30–40 Freeing arrangements; tankers.

(a) Vessels with bulwarks are to have open rails fitted for at least half the length of the exposed portion of the weather deck or other effective freeing arrangements. The upper edge of the sheer strake is to be kept as low as practicable and preferably not higher than the upper edge of the gunwale bar.

(b) Where superstructures are connected by trunks, open rails are to be fitted for the whole length of the weather portions of the freeboard deck.

§ 43.30–45 Plans; tanker.

(a) Plans showing proposed fittings and arrangements are to be submitted to the assigning authority for approval.

§ 43.30–50 Computation of freeboard; tanker.

(a) When the assigning authority is satisfied that the foregoing requirements are fulfilled, the summer freeboard may be computed from the table for tankers; all corrections except those for flushdeck steamers, detached superstructures, excess sheer, and winter voyages across the North Atlantic are to be made in accordance with §§ 43.15–1—43.15–97.

§ 43.30–55 Deductions for detached superstructures; tankers.

(a) When the total effective length of superstructure is less than 1.0*L*, the deduction is a percentage of that for a superstructure of length 1.0*L*, and is obtained from Table 43.30–55(a).

TABLE 43.30-55(a)—TOTAL EFFECTIVE LENGTH OF SUPERSTRUCTURES

[Percent]

	0	0.1*L*	0.2*L*	0.3*L*	0.4*L*	0.5*L*	0.6*L*	0.7*L*	0.8*L*	0.9*L*	1.0*L*
All types	0	7	14	21	31	41	52	63	75.3	87.7	100

§ 43.30-60 Deduction for excess sheer; tanker.

(a) Where the sheer is greater than the standard, the correction for excess sheer (see § 43.15-73) is deducted from the freeboard for all tankers. Section 43.15-77 does not apply except that the maximum deduction for excess sheer is 1½ inches at 100 feet and increases at the rate of 1½ inches for each additional 100 feet in the length of the vessel.

§ 43.30-65 Winter North Atlantic freeboard; tanker.

(a) The minimum freeboard for tankers on voyages across the North Atlantic from a port or place of departure north of latitude 36° N. to a port or place of arrival north of latitude 36° N., regardless of the route of the vessel while it is in either of the northern seasonal winter zones during the winter season, shall be the winter freeboard plus an addition at a rate of one inch per 100 feet in length.

§ 43.30-70 Freeboard table for tankers.

(a) Table 43.30-70(a) gives the basic minimum summer freeboard for tankers which comply with the standards in this part.

TABLE 43.30-70(a)—BASIC MINIMUM FREEBOARD FOR TANKERS

L (feet)	Freeboard (inches)
190	21.5
200	23.1
210	24.7
220	26.3
230	28.0
240	29.7
250	31.5
260	33.3
270	35.2
280	37.1
290	39.1
300	41.1
310	43.1
320	45.1
330	47.1
340	49.2
350	51.3
360	53.5
370	55.7
380	57.9
390	60.2
400	62.5
410	64.9
420	67.4
430	69.9
440	72.5
450	75.1
460	77.7
470	80.2
480	82.7
490	85.1
500	87.5
510	89.8
520	92.1
530	94.3
540	96.5
550	98.6
560	100.7
570	102.7
580	104.6
590	106.5
600	108.4
610	110.1
620	111.7
630	113.1
640	114.5
650	115.9
660	117.3
670	118.6
680	119.9
690	121.2
700	122.5
710	123.7
720	124.9
730	126.1
740	127.3
750	128.5
760	129.6
770	130.7
780	131.8
790	132.9
800	134.0
810	135.1
820	136.2
830	137.2
840	138.2
850	139.2
860	140.1
870	141.0
880	141.9
890	142.8

TABLE 43.30-70(a)—BASIC MINIMUM FREEBOARD FOR TANKERS—Continued

L (feet)	Freeboard (inches)
900	143.7
910	144.5
920	145.3
930	146.1
940	146.9
950	147.7
960	148.5
970	149.2
980	149.8
990	150.4
1,000	151.0
(¹)	(¹)

¹ Vessels above 1,000 feet are to be dealt with by the administration.

§ 43.30-75 Freeboard table for tankers on United States coastwise and/or intercoastal voyages.

(a) Tankers which are structurally qualified to be operated at the resulting deeper drafts may be assigned load lines, valid only for United States coastwise and/or intercoastal voyages, which have been computed on the basis of Table 43.30-75(a) in lieu of Table 43.30-70(a).

TABLE 43.30-75(a)—BASIC MINIMUM FREEBOARD FOR TANKERS ON UNITED STATES COASTWISE AND/OR INTERCOASTAL VOYAGES

L Feet	Freeboard Inches
(¹)	(¹)
310	43.0
320	44.7
330	46.3
340	47.9
350	49.5
360	51.1
370	52.7
380	54.4
390	56.3
400	58.3
410	60.4
420	62.5
430	64.6
440	66.8
450	69.0
460	71.3
470	73.5
480	75.7
490	77.9
500	80.1
510	82.3
520	84.5
530	86.6
540	88.7
550	90.7
560	92.7
570	94.7
580	96.6
590	98.5
600	100.3
610	102.1
620	103.9
630	105.7
640	107.4
650	109.1
660	110.8
670	112.4
680	114.0
690	115.5
700	117.0
710	118.4
720	119.8
730	121.2
740	122.6
750	123.9
760	125.2
770	126.4
780	127.6
790	128.8
800	130.0
810	131.1
820	132.2
830	133.3
840	134.4
850	135.5
860	136.5
870	137.5
880	138.5
890	139.5
900	140.5
910	141.5
920	142.4
930	143.3
940	144.3
950	145.2
960	146.1
970	147.0
980	147.8
990	148.6
1,000	149.4
(²)	(²)

¹ For vessels up to 300 feet the freeboards given by Table 43.30-70(a) apply.

² Vessels above 1,000 feet are to be specially considered.

(b) The provisions of this section shall be applicable only to freeboard assignments made to U.S.-flag vessels engaged on coastwise and/or intercoastal voyages prior to January 6, 1967.

[CGFR 65-50, 30 FR 16730, Dec. 30, 1965, as amended by CGFR 68-60, 33 FR 10076, July 12, 1968]

Subpart 43.35—Lumber Schooners

§ 43.35-1 Load line marks for vessels specially constructed for the carriage of complete cargoes of timber (lumber schooner type).

(a) Load lines for existing vessels propelled by either sail or steam which have been specially constructed to carry complete cargoes of timber (that is, of the lumber schooner type) when carrying a complete cargo of timber will be marked with a load line as provided in § 43.01-15. The mark is illustrated by figure 43.35-1(a).

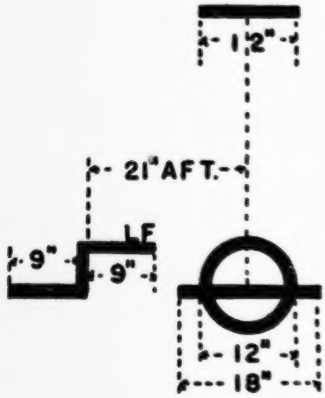


FIGURE 43.35-1(a).—Timber load line for vessels constructed for the carriage of complete cargoes of timber.

(b) Existing vessels which have been specially constructed to carry complete cargoes of timber (the lumber schooner type) and which carry cargoes other than complete timber cargoes, will be marked as provided in § 43.01-15, the marking is illustrated by figure 43.35-1(b).

(c) The forward mark will be determined as provided in §§ 43.15-1—43.15-97 or §§ 43.20-1—43.20-45, as applicable to the type of vessel dealt with.

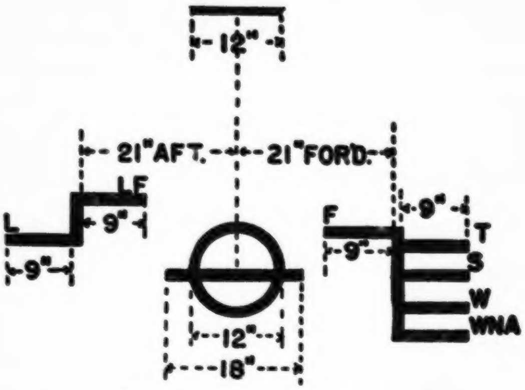


FIGURE 43.35-1(b).—Timber load line in conjunction with steamer load line for vessels constructed for the carriage of complete cargoes of timber.

Subpart 43.40—Zone and Seasonal Areas and Miscellaneous Requirements

§ 43.40-1 Boundaries of the zones and seasonal areas.

(a) For the purpose of the regulations in this Part, the boundaries of zones and seasonal areas shall be as set forth in §§ 42.30-1 to 42.30-35, inclusive, in this subchapter.

[CGFR 68-60, 33 FR 10076, July 12, 1968]

§ 43.40-5 Fees, travel expenses.

(a) For the purpose of the regulations in this part, fees and traveling expenses payable by owners to the assigning and issuing authority for load line services rendered shall be as specified in Subpart 42.35 of this subchapter.

[CGFR 68-126, 34 FR 9019, June 5, 1969]

§ 43.40-15 Titles of load line laws and rules regarded as equivalent to the British Board of Trade Rules, 1906.

(a) *Australia.* Part IV of the Navigation Act, 1912-1920, and Navigation (Load Line) Regulations of the 17th December 1924.

(b) *Belgium.* Loi sur la sécurité des navires (7 décembre 1920).

(c) *Chile.* Reglamento para el trazato del disco marcas y linea oficial de carguio de las naves mercantes (Decree No. 1892 of the 12th November 1919).

(d) *Denmark.* Merchant Shipping (inspection of ships) Act of the 29th March 1920, with later amendments.

Rule and Tables of Freeboard for Ships, dated the 30th September 1909, as amended by notification of the 25th July 1918.

(e) *France.* Loi du 17 avril 1907, arrêté du 5 septembre 1908. Décret du 21 septembre 1908. Autre décret du 21 septembre 1908, modifié par le décret du 1 septembre 1925. Décret du 12 mai 1927. Décret du 17 janvier 1928.

(f) *Germany.* Vorschriften der See-Berufsgenossenshaft über den Freibord fur Dampfer und Segelschiffe, Ausgabe 1908.

(g) *Hong Kong.* Merchant shipping consolidation ordinance (No. 10 of 1899), as amended by ordinances Nos. 31 of 1901, 2 of 1903, 5 of 1905, 16 of 1906, 9 of 1909, and 6 of 1910.

(h) *Iceland.* Law No. 58 of the 14th June, 1929, sections 25-26.

(i) *India.* Indian Merchant Shipping Act, 1923.

(j) *Italy.* Regole e tavole per assignazione del "Bordo Libero", approved by decree dated the 1st February 1929—VII of the Italian Minister for Communications.

Prior to 1929—British Board of Trade Rules, 1906.

(k) *Japan.* Ship load line law [Law No. 2 of the 10th year of Taisho (1921)] and the rules and regulations relating thereto.

(l) *Netherlands.* Decree of the 22d September 1909 (Official Journal No. 315).

(m) *Netherland Indies.* Netherlands decree of the 22d September 1909 (Official Journal No. 315).

(n) *New Zealand.* British Board of Trade Rules, 1906.

(o) *Norway.* Norwegian Freeboard Rules and Tables of 1909.

(p) *Portugal.* Decree No. 11,210 of the 18th July 1925, and regulations and instructions relating thereto.

(q) *Spain.* Reglamento para el Trazado del Disco y Marcas de Maxima Carga de los buques marchantes, 1914.

(r) *Straits Settlements.* British Board of Trade Rules, 1906.

(s) *Sweden.* Rules and Tables of Freeboard approved by decree of the 21st May 1910.

(t) *United Kingdom.* Board of Trade Rules, 1906.

(u) *Union of Soviet Socialist Republics.* Rules and Regulations relating to the Load Lines of Seagoing Merchant Vessels, published by Register of the Union of Soviet Socialist Republics, 1928.

PART 44—VARIANCE FOR STEAM COLLIERS, BARGES, AND SELF-PROPELLED BARGES (WHEN ENGAGED IN SPECIAL SERVICES ON COASTWISE AND INTER-ISLAND VOYAGES)

Subpart 44.01—Administration

Sec.

44.01-1 Establishment of load lines for special services.
44.01-5 Administration; special service.
44.01-10 Approval by Commandant, U. S. Coast Guard, of special service.
44.01-11 Assignment and marking load lines; special service.
44.01-12 Voyage limits; special service.
44.01-13 Heavy weather plan.
44.01-15 Special service certificate.
44.01-20 New and existing vessels; special service.

Subpart 44.05—Rules of Assignment; Special Service

44.05-1 General.
44.05-5 Definitions.
44.05-10 Load line markings.
44.05-15 Existing vessels.
44.05-20 Conditions of assignment.
44.05-25 Freeboards.
44.05-30 Load line certificate.
44.05-35 Form of load line certificate.

AUTHORITY: Sec. 2, 49 Stat. 888, as amended, sec. 6(b)(1), 80 Stat. 938; 46 U.S.C. 88a, 49 U.S.C. 1655(b); 49 CFR 1.4(a)(2), unless otherwise noted.

SOURCE: CGFR 65-50, 30 FR 16755, Dec. 30, 1965, unless otherwise noted.

Subpart 44.01—Administration

§ 44.01-1 Establishment of load lines for special services.

(a) Load lines are established for steam colliers, tugs, barges, and self-propelled barges engaged in special services in conformity with the Coastwise Load Line Act, 1935, as amended (46 U.S.C. 88-88i).

(b) Load lines for steam colliers, barges, and self-propelled barges engaged on specially limited coastwise voyages as described in § 44.01-12 shall be established pursuant to the regulations in this Part.

(c) Variance for tugs is not permitted.

§ 44.01-5 Administration; special service.

(a) The administrative provisions of §§ 42.01-1 to 42.11-20 inclusive of this subchapter, relating to vessels engaged in foreign and coastwise voyages, where applicable, shall apply to vessels subject to this Part except as modified in paragraph (b) of this section.

(b) Application for the assignment of load lines under this Part for the types of vessels described in § 44.01-1 shall be made in writing to the American Bureau of Shipping unless another society has been specifically approved by the Commandant as a load line assigning authority. In the latter case application shall be made to the society so approved. Applications shall state the following information:

(1) Name of vessel and official number.

(2) Type of vessel (steam collier, barge, or self-propelled barge).

(3) Date keel was laid.

(4) Normal sea speed of vessel.

(5) Limits of voyage for which approval is requested.

(6) Normal maximum distance offshore in course of voyage.

(7) Length of voyage in days and nautical miles.

(8) Statement of weather conditions to be expected.

(9) Cargo to be carried.

(10) Whether vessel is to be operated manned or unmanned.

[CGFR 65-50, 30 FR 16755, Dec. 30, 1965, as amended by CGFR 68-60, 33 FR 10076, July 12, 1968]

§ 44.01-10 Approval by Commandant, U.S. Coast Guard, of special service.

(a) Subject to the conditions contained in this Part, the Commandant, U.S. Coast Guard, has determined that load lines at variance from the position fixed by the International Convention on Load Lines, 1966, but not above the actual line of safety, may be assigned steam colliers, barges, or self-propelled barges (separately by class) for certain specifically limited coastwise voyages between ports of the continental United States or between islands of a group over which the United States has jurisdiction.

[CGFR 65-50, 30 FR 16755, Dec. 30, 1965, as amended by CGFR 68-60, 33 FR 10076, July 12, 1968]

§ 44.01-11 Assignment and marking load lines; special service.

(a) The assignment and marking of special service load lines and certifications thereof shall be in accordance with this Part to the satisfaction of the American Bureau of Shipping. The load line certificate shall define the voyage limits and seasonal restrictions governing the validity of the load lines.

§ 44.01-12 Voyage limits; special service.

(a) Special service load lines may be assigned for operation not more than a specified limited distance offshore which shall not exceed 20 nautical miles. The offshore distance shall be measured from the coastline except where a line of inland waters has been otherwise established.

(b) For continental United States ports, special service load lines may be issued for operation between but not to exceed the extreme port limits specified below, or for operation between intermediate ports within the extreme limits specified:

(1) Central and Northern Atlantic Coast—From Norfolk, Virginia, to Eastport, Maine.

(2) Southeast Atlantic Coast—from Key West, Florida, to Jacksonville, Florida, except that the special service load line is not valid for manned vessels during the hurricane season, i.e., July 1st to November 15th, both dates inclusive, unless the vessel is operated in accordance with a Coast Guard approved heavy weather plan.

(3) Gulf of Mexico Coast—from the mouth of the Rio Grande River, Texas, to Key West, Florida, except that the special service load line is not

valid for manned vessels during the hurricane season, i.e., July 1st to November 15th, both dates inclusive, unless the vessel is operated in accordance with a Coast Guard approved heavy weather plan.

(4) Pacific Coast—From San Francisco, California, to San Diego, California.

(c) Assignment of special service load lines for voyage limits between the islands of a group over which the United States has jurisdiction shall be made only upon authorization by the Commandant, U.S. Coast Guard, after submittal to him of the information called for by § 44.01-5(b).

(46 U.S.C. 88a, 49 CFR 1.46(b))

[CGFR 65-50, 30 FR 16755, Dec. 30, 1965, as amended by CGD 79-142, 45 FR 57402, Aug. 28, 1980]

§ 44.01-13 Heavy weather plan.

(a) Each heavy weather plan under § 44.01-12(b) must be prepared by the vessel owner or operator and approved by the cognizant Officer in Charge, Marine Inspection. Approval of a heavy weather plan is limited to the current hurricane season.

(b) The cognizant Officer in Charge, Marine Inspection, is—

(1) The Officer in Charge, Marine Inspection, within whose area the work site is located for a vessel that will be operating in a limited geographical area; or

(2) The Officer in Charge, Marine Inspection, within whose area the point of departure is located for a transiting vessel.

(c) The required content of the heavy weather plan is determined on a case-by-case basis by the cognizant Officer in Charge, Marine Inspection, based on knowledge of the local conditions. The heavy weather plan may contain weather radio frequencies and time schedules for seeking a harbor of safe refuge. A single heavy weather plan may be accepted for more than one vessel operating at a single work site or on a single route.

(d) The vessel owner or operator must place a copy of the heavy weather plan on each vessel to which it applies and ensure that it remains there throughout the hurricane season.

(46 U.S.C. 88a, 49 CFR 1.46(b))

[CGD 79-142, 45 FR 57402, Aug. 28, 1980]

§ 44.01-15 Special service certificate.

(a) The use of the special service load line certificate issued under this part is limited to voyages only as described in the certificate. If the vessel engages on any voyage not contemplated by the certificate where a load line is required, the load line prescribed by Part 42 of this subchapter shall govern.

(b) Vessels engaged on special services in the coastwise trade and the interisland trade will be certificated on the form shown in § 44.05-35.

[CGFR 65-50, 30 FR 16755, Dec. 30, 1965, as amended by CGFR 68-60, 33 FR 10076, July 12, 1968]

§ 44.01-20 New and existing vessels; special service.

(a) A new vessel marked with load lines for special service on a coastwise or inter-island voyage is a vessel whose keel was laid on or after September 28, 1937. An existing vessel is one whose keel was laid before that date.

Subpart 44.05—Rules of Assignment; Special Service

§ 44.05-1 General.

(a) The load line regulations in this part are complementary to those in Part 42 or Part 45 (Great Lakes load line regulations) of this subchapter, as reference is made thereto.

[CGFR 65-50, 30 FR 16755, Dec. 30, 1965, as amended by CGFR 68-60, 33 FR 10076, July 12, 1968]

§ 44.05-5 Definitions.

(a) A steam collier is a vessel mechanically propelled, and specially designed for the carriage of coal in bulk.

(b) A towed barge is a vessel without sufficient means of self-propulsion and which requires to be towed.

(c) A self-propelled barge is a vessel mechanically propelled of the type specially designed for use in limited coastwise and Great Lakes service and capable of transiting interconnecting canals.

§ 44.05-10 Load line markings.

(a) The load line marks on the vessel's sides are to be in accordance with § 43.05-15 of this subchapter, figure 43.05-5(a). Seasonal markings such as "Winter North Atlantic" which are not applicable to the voyage will be omitted.

(b) In the case of vessels which engage in special services on coastwise voyages and voyages on the Great Lakes, the marks on the vessel's sides are to be in accordance with Figure 44.05-10(b), except that the lines marked "SW" and "MS" shall be used only where applicable.

(c) The load lines aft of the combined disk and diamond will be applicable for voyages on the Great Lakes and those on the forward side will be applicable to limited coastwise voyages. The summer line on the ocean will correspond to the summer line on the Lakes and the winter line on the ocean will correspond to the intermediate line on the Lakes.

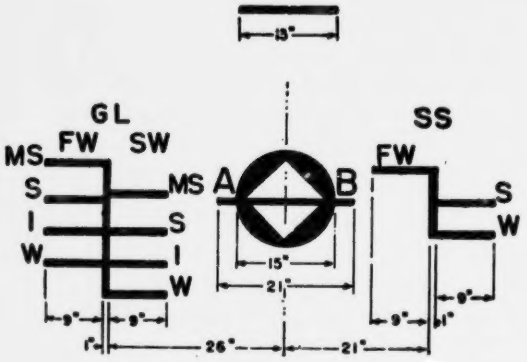


Figure 44.05-10(b).

(d) In the case of vessels which operate both on special service coastwise voyages and no unlimited coastwise voyages, the marks on the ship's sides are to be in accordance with figure 44.05-10 (d). The load lines aft of the disk will be applicable to voyages in special service coastwise or inter-island voyages and those on the forward side will be applicable to unlimited coastwise voyages. (A vessel marked for both special service and unlimited coastwise voyages and furnished with a load line certificate on the international form shall, when entering the foreign trade, arrange that the load line markings are in accord with the vessel's international load line certificate by the elimination of the marks aft of the disk.)

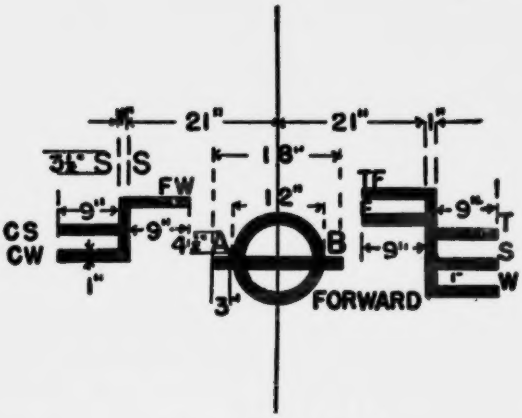


Figure 45.05-10(d)

§ 44.05-15 Existing vessels.

(a) In assigning load lines to an existing vessel the provisions of the regulations in this part shall be complied with in principle and detail insofar as is reasonable and practicable, having regard to the proven efficacy of existing arrangements for a special service voyage, and having particular regard to the provision of sufficient means for the protection and safety of the crew.

(b) Where it is neither reasonable nor practicable to comply with this part in its entirety, the assigning authority will, in each case, report to the Commandant, U.S. Coast Guard, the specific matters in which the vessel is deficient with such recommendations as may seem desirable. Upon the receipt of this report the Commandant, U.S. Coast Guard, shall determine such addition to the freeboard as will, in the judgment of the Commandant, U.S. Coast Guard, make the vessel as safe as if it had fully complied with this part.

§ 44.05–20 Conditions of assignment.

(a) *Steam colliers.* The conditions of assignment for steam colliers shall be in accordance with the requirements of Part 42 of this subchapter, except that in the case of steam colliers constructed with bulwarks, the freeing port may be of a practically continuous slot type, located as low as possible, the clear area of the slot to be not less than 20 percent of the superficial area of the unpierced bulwarks. If, due to sheer, or other conditions, the assigning authority considers that extra local provision should be made for freeing decks of water, the slots are to be located so as to have maximum efficacy.

(b) *Towed barges.* The conditions of assignment for towed cargo barges where the cargo is carried under deck shall be in accordance with §§ 45.10–5 to 45.10–100 of this subchapter. In the case of tank barges and cargo barges carrying cargo only on deck, compliance will also be required with the supplementary conditions of §§ 45.20–1 to 45.20–70 of this subchapter. In the case of cargo barges of the open type, assignment will be limited to barges in unmanned operation and the construction of the vessel must be such as to satisfy the assigning authority that no unusual hazards will be experienced.

(c) *Self-propelled barges.* The conditions of assignment for self-propelled cargo barges carrying cargo under decks shall be in accordance with the provisions of §§ 45.10–5 to 45.10–100 of this subchapter. In the case of self-propelled tank barges and self-propelled cargo barges carrying cargo only on deck, compliance will also be required with the supplementary conditions of §§ 45.20–1 to 45.20–70 of this subchapter.

[CGFR 65–50, 30 FR 16755, Dec. 30, 1965, as amended by CGFR 68–60, 33 FR 10076, July 12, 1968]

§ 44.05–25 Freeboards.

(a) *General.* (1) When the assigning authority is satisfied that the requirements of this part as applicable to the type of vessel under consideration are complied with the freeboards will be computed as described in this section.

(2) The requirements in §§ 42.09–1 and 42.09–10 that relate to the assignment of freeboards and to stability are applicable to each vessel subject to the requirements in this Part.

(3) The assigning authority that assigns a vessel subject to the requirements in this Part a freeboard under part 45 of this chapter shall do so in accordance with the requirements in effect as of October 1, 1972.

(b) *Steam colliers.* Steam colliers that have constructional features similar to those of a tanker which afford extra invulnerability against the sea may be assigned a reduction of freeboard from that determined under Part 42 of this subchapter. The amount of such reduction shall be determined by the assigning authority, in relation to the freeboard assigned to tankers, having regard to the degree of compliance with the supplementary conditions of assignment laid down for these ships, but without regard to the degree of subdivision provided. The freeboard assigned to such a vessel shall in no case be less than would be assigned the vessel as a tanker, as determined under Part 42 of this subchapter.

(c) *Towed cargo barges with cargo under deck.* The freeboard is to be computed under §§ 45.15–1 to 45.15–97 of this subchapter. The fresh water and seasonal markings where applicable are to be determined under Part 42 of this subchapter.

(d) *Towed cargo barges with cargo only on deck.* The freeboard for barges of this type is to be computed in accordance with the requirements of §§ 45.20–1 to 45.20–70 of this subchapter. The fresh water and seasonal markings where applicable are to be the same as determined under Part 42 of this subchapter.

(e) *Towed cargo barges of the open type.* The load line shall be placed where, in the judgment of the assigning authority, the draft will be such that no unusual hazard will be experienced. In general, drafts assigned will be such that the barge will remain afloat with a reasonable freeboard after flooding of the net available open space.

(f) *Towed tank barges.* The freeboard is to be computed in accordance with §§ 45.20-1 to 45.20-70 of this subchapter. The fresh water and seasonal markings where applicable are to be determined under Part 42 of this subchapter.

(g) *Self-propelled cargo barges.* The freeboard is to be computed under §§ 45.15-1 to 45.20-15 of this subchapter. The fresh water and seasonal markings where applicable are to be determined under Part 42 of this subchapter.

(h) *Self-propelled tank barges.* The freeboard is to be computed in accordance with §§ 45.20-1 to 45.20-70 of this subchapter. The fresh water and seasonal markings where applicable are to be determined under Part 42 of this subchapter.

[CGFR 65-50, 30 FR 17655, Dec. 30, 1965, as amended by CGFR 68-60, 33 FR 10077, July 12, 1968; CGD 73-49R, 38 FR 12290, May 10, 1973]

§ 44.05-30 Load line certificate.

(a) The load line certificates for a special service coastwise or special inter-island voyage shall be issued in addition to any other applicable load line certificates and shall be on the form shown in §§ 44.05-35.

§ 44.05-35 Form of load line certificate.

(a) Where no other Load Line certificate is issued:

LOAD LINE CERTIFICATE FOR A SPECIAL SERVICE COASTWISE OR INTER-ISLAND VOYAGE

Issued under the authority of the Commandant, U.S. Coast Guard, United States of America, under the provisions of the Coastwise Load Line Act of August 27, 1935, as amended.

[SEAL]

Issued by ——————————
Certificate No.——————————

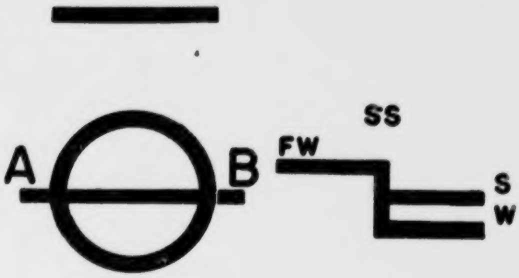
This certificate is valid only for coastwise or inter-island voyages that are between the limits of ————and ———provided the vessel is engaged solely in the trade stated herein.

Ship ——————————
Official No. ——————————
Port of registry ——————————
Trade of vessel ——————————
Gross tonnage ——————————

FREEBOARD FROM DECK LINE	LOAD LINE
Tropical (T)..........................	Above (S)
Summer (S)..........................	Upper edge of line through center of disk.
Winter (W)..........................	Below (S)

*Allowance for fresh water for all freeboards (except on the Great Lakes) ———

The upper edge of the deck line from which these freeboards are measured is ——— inches above the top of the———deck at side.



This is to certify that this ship has been surveyed and the freeboards and load lines shown above have been found to be correctly marked upon the vessel in manner and location as provided by the Load Line Regulations of the Commandant, U.S. Coast Guard, applicable to vessels engaged on this special service voyage.

**This certificate remains in force until ——————. Issued at —————— on the ——— day of —————, 19——.

(Here follows the signature or seal and description of the assigning authority)

NOTES: (1) In accordance with the Load Line Regulations, the disk or diamond and the lines must be permanently marked by center punch marks or cutting.

(2) The load line assignment given by this certificate necessarily assumes that the nature and stowage of cargo, balast, etc., are such as to secure sufficient stability for the vessel. Accordingly, it is the owner's respon-

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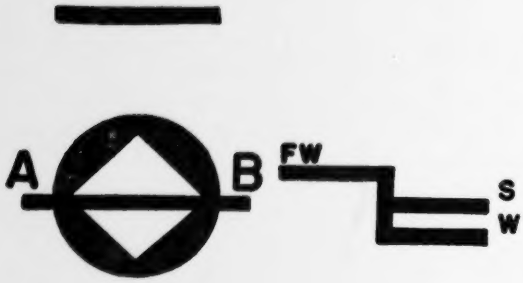
*Where seagoing steamers navigate a river or inland water, deeper loading is permitted corresponding to the weight of fuel, etc., required for consumption between the point of departure and the open sea.

**Upon the expiration of the certificate renewal must be obtained as provided by the Load Line Regulations and the certificate so endorsed. Endorsement should also be made in the spaces provided on the occasion of each annual inspection required by the Load Line Regulations.

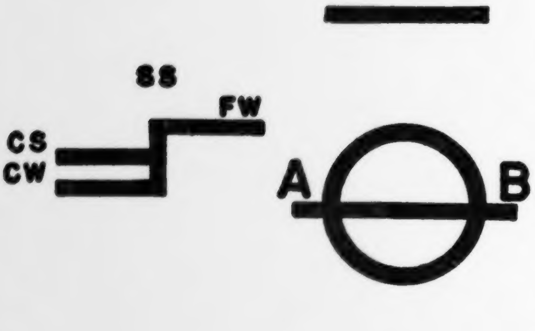
sibility to furnish the Master of the vessel with stability information and instructions when this is necessary to maintenance of sufficient stability.

(On the reverse side of the load line certificate, the provision for annual inspection endorsement and for renewal of the certificate is to be the same as for vessels engaged in the foreign trade.)

(b) Where the Special Service Load Line Certificate is issued in addition to a Great Lakes Load Line Certificate, the wording of the Special Service Load Line Certificate is to be identical to that given in paragraph (a) of this section, but the markings indicated in the form shall be replaced by the following markings:



(c) Where the Special Service Load Line Certificate is issued in addition to an Unlimited Coastwise or International Load Line Certificate, the wording of the Special Service Load Line Certificate is to be identical to that given in paragraph (a) of this section, but the markings indicated in the form shall be replaced by the following markings:



PART 45—GREAT LAKES LOAD LINES

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45.9 Seasonal application of load lines for vessels not marked under this part.
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45.13 Form of certificate.
45.15 Exemptions.

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APPENDIX A—LOAD LINE CERTIFICATE FORM

AUTHORITY: Sec. 2, 49 Stat. 888, as amended, sec. 6(b)(1), 80 Stat. 937; 46 U.S.C. 88a, 49 U.S.C. 1655(b)(1); 49 CFR 1.46(b).

SOURCE: CGD 73-49R, 38 FR 12290, May 10, 1973, unless otherwise noted.

Subpart A—General

§ 45.1 Purpose.

This Part prescribes requirements for assignment of freeboards, issuance of loadline certificates, and marking of loadlines to meet the requirements of the Coastwise Load Line Act, 1935 (46 U.S.C. 88–88g) insofar as it applies to the Great Lakes of North America.

§ 45.3 Definitions.

As used in this Part:

(a) "Length (L)" means 96 percent of the total length on a waterline at 85 percent of the least moulded depth measured from the top of the keel or the length from the foreside of the stem to the axis of the rudder stock on that waterline, if that is greater. In ships designed with a rake of keel the waterline on which this length is measured must be parallel to the designed waterline.

(b) "Perpendiculars" means the forward and after perpendiculars at the forward and after ends of the length (L). The forward perpendicular coincides with the foreside of the stem on the waterline on which the length is measured.

(c) "Amidships" means the middle of the length (L).

(d) "Breadth" unless expressly provided otherwise, means the maximum breadth of the ship, measured amidships to the moulded line of the frame in a ship with a metal shell and to the outer surface of the hull in a ship with a shell of any other material.

(e) "Moulded Depth" means the vertical distance measured amidships from the top of the keel to the top of the freeboard deck beam at side except that—

(1) In vessels of other than metal construction, the distance is measured from the lower edge of the keel rabbet;

(2) Where the form at the lower part of the midship section is of a hollow character, or where thick garboards are fitted, the distance is measured from the point where the line of the flat of the bottom continued inwards cuts the side of the keel;

(3) In ships having rounded gunwales, this distance is measured to the point of intersection of the moulded lines of the deck and side, the lines extending as though the gunwale were of angular design; and

(4) Where the freeboard deck is stepped and the raised part of the deck extends over the point at which the moulded depth is to be determined, the distance is measured to a line of reference extending from the lower part of the deck along a line parallel with the raised part.

(f) "Depth for Freeboard (D)" means—

(1) Moulded depth amidships plus the thickness of the stringer plate with no allowance for sheathing; and

(2) In a vessel having a rounded gunwale with a radius greater than 4 percent of the breadth (B) or having topsides of unusual form, the depth for freeboard (D) of a vessel having a midship section with vertical topsides and with the same round of beam and area of topside section equal to that provided by the actual midship section.

(g) "Freeboard" means the distance measured vertically downwards amidships from the upper edge of the deck line to the upper edge of the related load line.

(h) "Freeboard Deck" means, normally, the uppermost complete deck exposed to weather and sea that has permanent means of closing all openings in the weather part thereof and below which all openings in the sides of the ship are fitted with permanent means of watertight closings except that—

(1) In a ship having a discontinuous freeboard deck, the lowest line of the exposed deck and the continuation of that line parallel to the upper part of the deck is the freeboard deck.

(2) At the option of the owner and subject to the approval of the Commandant a lower deck may be designated as the freeboard deck, if it is a complete and permanent deck continuous in a fore and aft direction at least between the machinery space and peak bulkheads and continuous athwartships;

(3) When this lower deck is stepped the lowest line of the deck and the continuation of that line parallel to the upper part of the deck is taken as the freeboard deck.

(i) "Superstructure" means a deck structure on the freeboard deck, extending from side to side of the ship or with the side plating not being inboard of the shell plating more than 4 percent of the breadth (B). A raised quarterdeck is a superstructure.

(j) "Enclosed superstructure" means a superstructure with enclosing bulkheads.

(k) "Height" of a superstructure means the least vertical height measured at side from the top of the superstructure deck beams to the top of the freeboard deck beams.

(l) "Length of a superstructure (S)" means the mean length of the part of the superstructure which extends to the sides of the vessel and lies within the length (L).

(m) "Flush deck ship" means a ship that has no superstructure on the freeboard deck.

(n) "Weathertight" means that in any sea conditions water will not penetrate into the ship.

(o) "Watertight" means designed to withstand a static head of water.

(p) "Exposed positions" means exposed to weather and sea.

(q) "Intact bulkhead" with respect to superstructure means a bulkhead with no openings.

(r) "Steel" means steel and materials with which structures can be made equivalent to steel with respect to such parameters as yield strength, total deflection, flexural life, or resistance to galvanic or stress corrosion.

§ 45.5 Seasonal application of load lines.

For the purposes of the law and regulations prohibiting submergence of load lines (46 U.S.C. 88c; 46 CFR 42.07-10), the fresh water and salt water load lines marked under this Part apply during the following seasons:

(a) Summer load lines apply April 16 through April 30 and September 16 through September 30.

(b) Midsummer load lines apply May 1 through September 15.

(c) Intermediate load lines apply October 1 through October 31 and April 1 through April 15.

(d) Winter load lines apply November 1 through March 31.

§ 45.9 Seasonal application of load lines for vessels not marked under this part.

(a) For the purposes of the law and regulations prohibiting submergence of load lines (46 U.S.C. 88c; 46 CFR 42.07-10) the marks assigned to vessels holding international load line certificates apply during the following seasons:

(1) Vessels assigned freeboards as new vessels under the International Load Line Convention, 1966—

(i) Winter—November 1 through March 31.

(ii) Summer—April 1 through April 30 and October 1 through October 31.

(iii) Tropical—May 1 through September 30;

(2) Vessels assigned freeboards as existing vessels under the International Load Line Convention, 1966—

(i) Winter—November 1 through March 31;

(ii) Summer—April 1 through April 30 and October 1 through October 31;

(iii) Tropical—September 16 through September 30;

(iv) Tropical Fresh—May 1 through September 15.

(b) No allowances for lesser freeboards apply under any circumstances.

§ 45.11 Issue of load line certificate.

(a) A vessel 79 feet in length and more, and 150 gross tons or over, the keel of which is laid or which has reached a similar stage of construction after April 14, 1973, must meet the requirements of this part.

(b) Except as prescribed in paragraph (a) of this section, any vessel that meets the requirements in subparts C and D of this Part and the survey requirements in §§ 42.09-15 through 42.09-50 of this subchapter is entitled to assignment of freeboards and issue of a load line certificate under this Part by the Commandant or his authorized representative.

(c) A vessel, the keel of which was laid or was at a similar stage of construction before April 14, 1973, that meets the requirements of this part that were in effect before April 14, 1973, and the survey requirements in §§ 42.09-15 through 42.09-50 of this subchapter is entitled to the assignment of freeboards calculated under the provisions of this Part in effect before April 14, 1973, and to a load line certificate issued under this Part by the Commandant or his authorized representative.

§ 45.13 Form of certificate.

The form of a load line certificate issued under this Part is specified in appendix A to this Part.

§ 45.15 Exemptions.

(a) The Commandant may exempt a ship from any of the requirements in this Part if the chairman of the board of Steamship Inspections, Department of Transport, Canada, and the Commandant agree that the sheltered nature or the condition of that voyage make it unreasonable or impracticable to apply requirements of this Part.

(b) The Commandant may exempt a vessel that embodies features of a novel kind from any of the requirements of this Part if those requirements might seriously impede research into the development of such features and their incorporation in ships. Any such vessel must comply with the safety requirements that, in the opinion of the Commandant, are adequate for the service for which the vessel is intended and will insure the overall safety of the vessel. If the Commandant grants an exemption pursuant to this paragraph he communicates the details of the exemption and the reasons therefor to the chairman of the board of Steamship Inspections.

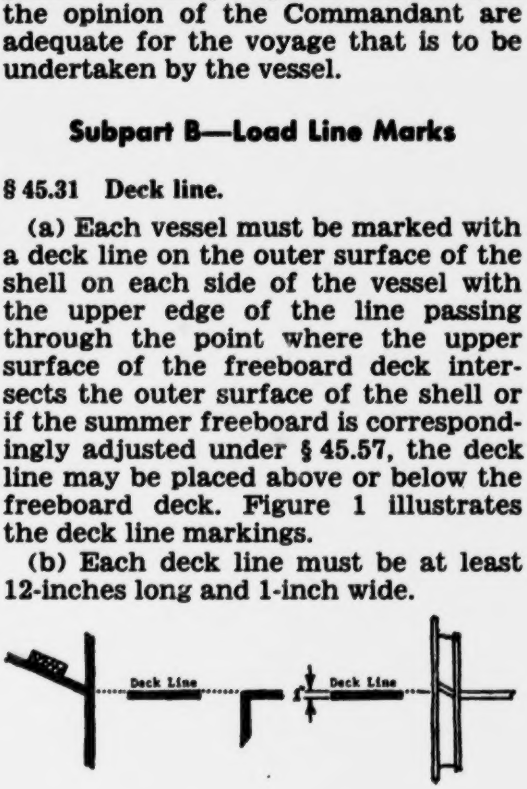
(c) A vessel that is not normally engaged on voyages to which this Part applies but that, in exceptional circumstances, is required to undertake a single such voyage between two specific ports may be exempted by the Commandant from any of the requirements of this Part, if the ship complies with safety requirements that, in the opinion of the Commandant are adequate for the voyage that is to be undertaken by the vessel.

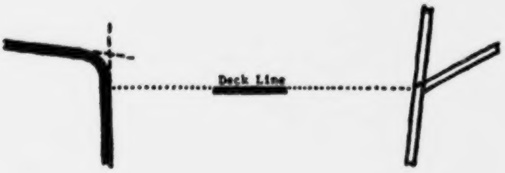
Subpart B—Load Line Marks

§ 45.31 Deck line.

(a) Each vessel must be marked with a deck line on the outer surface of the shell on each side of the vessel with the upper edge of the line passing through the point where the upper surface of the freeboard deck intersects the outer surface of the shell or if the summer freeboard is correspondingly adjusted under § 45.57, the deck line may be placed above or below the freeboard deck. Figure 1 illustrates the deck line markings.

(b) Each deck line must be at least 12-inches long and 1-inch wide.





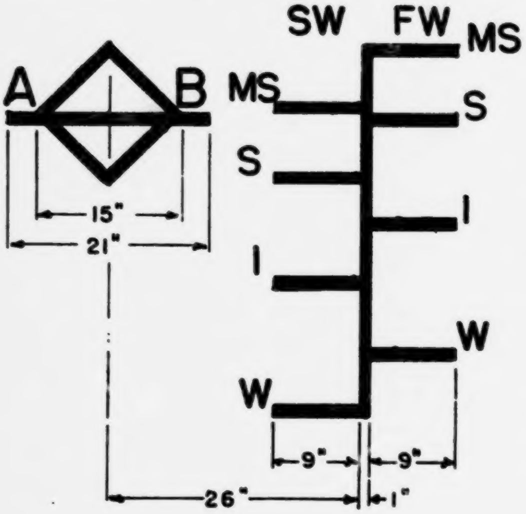
§ 45.33 Diamond.

(a) Each vessel must be marked with the diamond mark described in figure 2 of § 45.35 amidships below the upper edge of the deck line on each side with the center of the loadline mark at a distance below the deck line equal to the summer freeboard assigned under this Part.

(b) The width of each line in the loadline mark must be 1 inch.

§ 45.35 Seasonal load lines.

Each vessel must have the summer (S), midsummer (MS), intermediate (I), and winter (W) loadlines for fresh water freeboards calculated under §§ 45.71 through 45.75 marked in accordance with § 45.39.



§ 45.37 Salt water load lines.

Each vessel that operates in the salt water of the St. Lawrence River must—

(a) Be marked with the summer (S), midsummer (MS), intermediate (I) and winter (W) load line marks under § 45.77 for salt water; and

(b) Be marked with the letters "FW" above the fresh water marks and the letters "SW" above the salt water marks as described in figure 2.

§ 45.39 Marking.

(a) The diamond, lines, and letters must be painted in white or yellow on a dark ground or in black on a light ground and permanently marked on the sides of the vessel.

(b) The upper edge of the line that passes through the center of the diamond must indicate summer freeboard assigned under § 45.53.

(c) Unless otherwise authorized the seasonal load lines must be horizontal lines extending forward of, and at right angles to, a vertical line marked at a distance 26 inches forward of the vertical centerline of the diamond as described in figure 2.

(d) The salt water load lines must be horizontal lines extending abaft the vertical line required by paragraph (b) of this section as described in figure 2.

(e) The upper edge of each seasonal and salt water load line mark must indicate the minimum freeboard for that mark.

(f) When two freeboards assigned under this part differ by 2 inches or less, the line for the lesser freeboard must be omitted and the line for the greater freeboard must be identified with the seasonal letters for both freeboards.

(g) Seasonal freeboards that are limited by a summer freeboard assigned under § 45.53(c) must not be marked but the identifying letter must be marked adjacent to the summer mark.

(h) The identity of the authority that assigns the freeboard must be indicated alongside the load line diamond above the horizontal line that passes through the center of the diamond with two initials approximately 4½ inches high and 3 inches wide.

Subpart C—Freeboards

§ 45.51 Types of ships.

(a) For the purpose of this subpart, a type A vessel has—

(1) No cargo ports or similar side-shell openings below the freeboard deck;

(2) Only small freeboard deck openings fitted with watertight gasketed hatch covers of steel;

(3) No dimension of a freeboard deck cargo opening greater than 6 feet and the total area not exceeding 18 ft^2; and

(4) No more than two freeboard deck cargo openings to a single cargo space.

(b) For the purposes of this subpart a type B vessel is a vessel that does not meet the requirements in paragraph (a) of this section.

§ 45.53 Summer freeboard.

(a) Except as required in paragraph (c) of this section, the minimum freeboard in summer for a type A vessel is F in the following formula modified by the corrections in this subpart:

$$F\text{ (inches)}=10.2\times P_1\times D$$

where P_1 is defined in § 45.55 and D is the depth for freeboard in feet.

(b) Except as required in paragraph (c) of this section, the minimum freeboard in summer for a type B vessel is F in the formula modified by the corrections in this subpart:

$$F\text{ (inches)}=12\times P_1\times D$$

where P_1 is defined by § 45.55 and D is the depth for freeboard in feet.

(c) Seasonal freeboards assigned under §§ 45.71 through 45.75 must be calculated on the basis of the summer freeboard calculated under paragraph (a) or (b) of this section.

(d) If a minimum freeboard is required for a vessel under this Part which is greater than that required by paragraph (a) or (b) of this section because of scantling or subdivision requirements, the summer freeboard and the seasonal freeboards assigned under this subpart must be no less than that minimum freeboard, except the midsummer seasonal freeboard may be calculated on the basis of the summer freeboard assigned under this paragraph.

(e) If a greater than the calculated minimum freeboard is requested by the applicant for the load line certificate, that greater freeboard may be assigned as the summer freeboard and—

(1) The intermediate and winter seasonal freeboards assigned must be calculated under paragraph (a) or (b) of this section; and

(2) The midsummer seasonal freeboard must be calculated on the basis of the summer freeboard assigned under this paragraph.

§ 45.55 Freeboard coefficient.

(a) For ships less than 350 feet in length (L), the freeboard coefficient is P_1 in the formula:

$$P_1=P+A[(L/D)-(L/D_s)]$$

where P is a factor, which is a function of the length from table 1 and "A" is a coefficient, which is a function of length (L), from table 2; L/D is the ratio of the length (L) to the depth for freeboard (D); L/D_s is the ratio of the length (L) to a standard depth (D_s) from table 3.

D is not to be used as less than that which will give a ration of L to D that is:

(a) More than 15 when $L=400$ feet or less, or

(b) More than 21 when $L=700$ feet or more, with the ratio for intermediate lengths being calculated proportionately.

(b) For ships 350 feet or more in length (L), the coefficient "A" is zero and the formula is:

$$P_1=P$$

where P is a factor, which is a function of length from table (1).

§ 45.57 Correction: Position of deckline.

(a) Where the depth to the upper edge of the deckline is greater or less than D, the difference between the depths must be added to or deducted from the freeboard.

(b) When the Commandant or the approved assigning authority approves a location for the deckline that is above or below the freeboard deck, the minimum summer freeboard must be corrected by—

(1) Adding the difference between the depth and D if the depth is greater than D; and

(2) Subtracting the difference between the depth and D, if the depth is less than D.

(c) Except for the adjustment allowed in paragraph (b) of this section, no freeboard of less than 2 in. may be assigned.

§ 45.58 Correction: Short superstructure.

The minimum freeboard in summer for a type B vessel that is 79 ft. or more but less than 500 ft. in length and has enclosed superstructures with an effective length of 25 percent or less of the length of the vessel must be increased by—

$$0.03\,(500-L)\,(0.25-E/L)\text{ inches}$$

where

(L)=length of vessel in feet;

(E)=effective length of superstructure in feet as defined in § 45.59.

§ 45.59 Definitions for superstructure corrections.

For the purpose of §§ 45.58 through 45.61—

(a) The standard height of a superstructure (H_s) other than a raised quarter deck and the standard height of a trunk (H_s) is determined by the formula:

$$H_s=[6.0+(L/300)] \text{ ft}$$

(b) The length of superstructure (S) is the length of those parts of the superstructure which extends to the sides of the vessel and that lie within the length (L).

(c) The effective length (E) of a trunk is its length in the ratio of its mean breadth to B.

(d) The effective length (E) of an enclosed superstructure of standard height or greater is its length "S".

(e) Where the height of an enclosed superstructure or trunk is less than the standard height (H_s),the effective length (E) is its length reduced in the ratio of its height to H_s.

(f) The effective length (E) of a raised quarter deck of ⅔ H_s or greater that has no openings in the front bulkhead is its length up to a maximum of $0.6L$.

(g) The effective length (E) of a raised quarter deck of less than ⅔ $H_s$or that does not have an intact front bulkhead is its length reduced by the ratio of its height to H_s.

TABLE 12(1)

TABLES OF P VALUES

Length of Ship (feet)	Value of P
80	0.1100
90	0.1136
100	0.1172
110	0.1208
120	0.1244
130	0.1281
140	0.1318
150	0.1355
160	0.1393
170	0.1430
180	0.1468
190	0.1506
200	0.1545
210	0.1583
220	0.1622
230	0.1661
240	0.1700
250	0.1740
260	0.1780
270	0.1820
280	0.1860
290	0.1900
300	0.1941
310	0.1982
320	0.2023
330	0.2065
340	0.2106
350	0.2148
360	0.2190
370	0.2233
380	0.2275
390	0.2318
400	0.2361
410	0.2400
420	0.2437
430	0.2472
440	0.2506
450	0.2537
460	0.2567
470	0.2595
480	0.2621
490	0.2645
500	0.2667
510	0.2688
520	0.2706
530	0.2723
540	0.2738
550	0.2751
560	0.2762
570	0.2772
580	0.2779
590	0.2785
600	0.2788
610	0.2790
620	0.2790
630	0.2789
640	0.2785
650	0.2779
660	0.2772
670	0.2768
680	0.2760
690	0.2751
700	0.2740
710	0.2728
720	0.2715
730	0.2700
740	0.2684
750	0.2667
760	0.2648
770	0.2628
780	0.2607
790	0.2584
800	0.2560
810	0.2532
820	0.2504
830	0.2476
840	0.2448
850	0.2420
860	0.2392
870	0.2364
880	0.2336
890	0.2308
900	0.2280
910	0.2252
920	0.2224
930	0.2196
940	0.2168
950	0.2140
960	0.2112
970	0.2084
980	0.2056
990	0.2028
1000	0.2000

TABLE 12(2)

VALUES OF "A" FOR USE IN THE EXPRESSION

$P_1 = P + \text{"}A\text{"}\ (L/D - L/D_s)$

Length of Ship (feet)	Value of "A"
80	0.00864
90	0.00806
100	0.00750
110	0.00696
120	0.00644
130	0.00594
140	0.00546
150	0.00500
160	0.00456
170	0.00414
180	0.00374
190	0.00336
200	0.00300
210	0.00266
220	0.00234
230	0.00204
240	0.00176
250	0.00150
260	0.00126
270	0.00104
280	0.00084
290	0.00066
300	0.00050
310	0.00036
320	0.00024
330	0.00014
340	0.00006
350	0.00000

TABLE 12(3)

VALUES OF L/DS

Length of Ship (feet)	Value of L/D_s
80	6.50000
90	6.76563
100	7.03125
110	7.29688
120	7.56250
130	7.82813
140	8.09375
150	8.35938
160	8.62500
170	8.89063
180	9.19625
190	9.42188
310	12.60938
320	12.87500
330	13.14063
340	13.40625
350	13.67188
360	13.93750
370	14.20313
380	14.46875
390	14.73438
400	15.00000

(h) Superstructures which are not enclosed have no effective length.

(i) When a lower deck is designated as the freeboard deck, that part of the hull which extends above the freeboard deck is treated as a superstructure so far as concerns the application of the conditions of assignment and the calculation of freeboard.

(j) A bridge or poop is enclosed only when access is provided whereby the crew may reach accommodations, machinery, or other working spaces inside the superstructure by alternative means that are available at all times when bulkhead openings are closed.

§ 45.61 Correction for superstructures and trunks.

(a) Where the effective length *E* of superstructures and trunks that meet the requirements of Subpart D of this part is 1.0*L*, the minimum summer freeboard may be corrected by subtracting $\frac{1}{2}H_s$.

(b) Where the effective length of superstructures and trunks is less than 1.0*L* the minimum summer freeboard may be corrected by subtracting a percentage of one-half of the standard superstructure height (H_s) determined by the formula:

$$\text{Percentage} = (E/2L)(1 + E/L) \times 100$$

(c) To be eligible for the correction a trunk must—

(1) Be at least as strong and as stiff as a superstructure;

(2) Have no opening in the freeboard deck in way of the trunk, except small access openings;

(3) Have hatchway coamings and covers that meet §§ 45.143 through 45.147;

(4) Provide a permanent working platform fore and aft with guardrails;

(5) Provide fore and aft access between detached trunks and superstructures by permanent gangways;

(6) Be at least 60 percent of the breadth of the ship in way of the trunk; and

(7) Be at least 0.6 L in length, if no superstructure, is provided.

§ 45.63 Correction for sheer.

(a) The minimum summer freeboard must be increased by the deficiency, or may be decreased by the excess as limited by § 45.65, of sheer calculated from table 4, multiplied by:

$$0.75-(S/2L)$$

where S is the total length of enclosed superstructures. Trunks are not included.

§ 45.65 Excess sheer limitations.

The decrease in freeboard allowed in § 45.63 is limited as follows:

SHEER CALCULATION—TABLE 4

Station	Actual ordinate	S. M.	Product
After Half:			
AP		1	
L/6-AP		3	
L/3-AP		3	
Midship		1	—————
Sum of Aft Products			
After Standard Sheer .2665L+26.65[1]			—————
Difference: Sum-STD			————— + Excess/ − Deficiency
AFT Sheer: Diff÷8			————— Excess/Deficiency
Fwd. Half:			
FP		1	
L/6-FP		3	
L/3-FP		3	
Midships		1	—————
Sum of Fwd Products			
Fwd Standard Sheer .5330L+53.30[1]			—————
Difference: Sum-STD			————— + Excess/ − Deficiency
FWD Sheer: Diff÷8			————— Excess/Deficiency

[1] L in Standard Sheer=L or 500 whichever is less.

Sheer Summation

Aft Sheer+/−	—————	
Fwd Sheer+/−	—————	
Net Sheer+/−	—————	
Mean: Net−2	—————	Excess/Deficiency

(a) In vessels having no enclosed superstructure from 0.1 L abaft amidships to 0.1 L forward of amidships, no decrease is allowed.

(b) In vessels having enclosed superstructures amidships less than 0.1 L before and abaft amidships, the decrease must be reduced by linear interpolation.

(c) If excess sheer exists in the forward half, and the after half is at least 75 percent of standard sheer, the full decrease is allowed. If the after sheer is between 50 percent and 75 percent of standard sheer an intermediate decrease, determined by linear interpolation, is allowed for the excess sheer forward. If the after sheer is 50 percent of standard or less, no decrease is allowed for the excess sheer forward.

(d) Where an enclosed poop or forecastle is of standard height with greater sheer than that of the freeboard deck, or is greater than standard height, an addition to the sheer of the freeboard deck may be made using the following formula:

$$S=vL'/3L$$

Where s=sheer credit, to be deducted from the deficiency or added to the excess of sheer.

v=difference between actual and standard height of superstructure at the end ordinate.

L'=mean enclosed length of poop or forecastle up to a maximum length of 0.5 L.

The superstructure deck must not be less than standard height above this curve at any point. This curve must be used in determining the sheer profile for forward and after halves of the vessel.

(e) The maximum decreased for excess sheer must be no more than 1½ inches per 100 feet of length.

(f) Where the deck of an enclosed superstructure has at least the same sheer as the exposed freeboard deck, the sheer of the enclosed portion of the freeboard deck cannot be taken into account.

§ 45.67 Sheer measurement.

(a) The sheer is measured from the freeboard deck at side to a line of reference drawn parallel to the keel through the sheer line at amidships;

(b) In ships designed with a rake of keel or designed to trim by the stern, the sheer must be measured in reference to a line drawn through the sheer line at amidships parallel to the design load waterline.

(c) In flush deck ships and in ships with detached superstructures, the sheer must be measured at the freeboard deck.

(d) In ships with a step or break in the topsides, the sheer must be measured from the equivalent depth amidships.

(e) In vessels with a superstructure of standard height that extends over the whole length of the freeboard deck, the sheer must be measured on the superstructure deck. Where the height of superstructure exceeds the standard, the least difference (Z) between the actual and standard heights must be added to each end ordinate. Similarly, the intermediate ordinates at distance of ⅙ L and ⅓ L from each perpendicular must be increased by 0.444 Z and 0.111 Z respectively.

§ 45.69 Correction for bow height.

(a) The minimum summer freeboard of all manned vessels must be increased by the same amount in inches as any deficiency which may be shown by the following formulas:

(1) For vessels having a length of not less than 79 feet and not greater than 550 feet,

$$0.593\ L\ (1.0\text{-}L/1640)\ \text{inches—actual bow height}$$

(2) For vessels having a length greater than 550 feet,

$$(341.6\text{—}0.227\ \text{L})\ \text{inches—actual bow height}$$

(b) Where the bow height is obtained by sheer, the sheer must extend for at least 15 percent of the length of the vessel measured from the forward perpendicular.

(c) Where the bow height is obtained by a superstructure, the superstructure must be enclosed and extend from the stem to a point at least 0.06 L abaft the forward perpendicular.

(d) Vessels which, to suit exceptional operational requirements, cannot meet the requirements of paragraph (c) of this section may be given special consideration by the Commandant.

(e) The bow height is defined as the vertical distance at the forward perpendicular between the waterline corresponding to the assigned summer freeboard at the designed trim and the top of the exposed deck at side.

§ 45.71 Midsummer freeboard.

The minimum midsummer freeboard (fms) in inches is obtained by the formula:

$$fms=f(s)-0.3\text{Ts}$$

where

$f(s)$=summer freeboard in inches

Ts=distance in feet between top of keel and the summer load line.

§ 45.73 Winter freeboard.

The minimum winter freeboard (fw) in inches is obtained by the formula:

$$fw=f(s)+Ts\ (200)/L$$

where L=length L in feet but not less than 400 feet.

§ 45.75 Intermediate freeboard.

The minimum intermediate freeboard (f_I) in inches is obtained by the formula:

$$f_1 = f(s) + Ts(100)/L$$

where L=length L in feet but not less than 400 feet.

§ 45.77 Salt water freeboard.

(a) The salt water addition in inches to freeboard applicable to each fresh water mark is obtained by the formula:

$$\text{Addition} = \Delta/41T$$

where

Δ=displacement in fresh water, in tons of 2,240 pounds, at the summer load waterline.

T=tons per inch immersion, of 2,240 pounds, in fresh water at the summer load waterline.

(b) When the displacement at the summer load waterline cannot be certified, the addition in inches to the minimum freeboard in fresh water may be obtained by multiplying 0.25 by the summer draught in feet measured from the top of the keel to the center of the load line diamond.

Subpart D—Conditions of Assignment

§ 45.101 Purpose.

This subpart prescribes conditions that a vessel must meet to be eligible for assignment of a loadline under this Part.

§ 45.103 Structural stress and stability.

(a) The nature and stowage of the cargo, ballast, and other variable weights must be such as to make the vessel stable and avoid unacceptable structural stress.

(b) The vessel must meet all applicable stability and subdivision requirements of this chapter.

§ 45.105 Information supplied to the master.

Unless otherwise authorized by the Commandant, the vessel must have onboard, in a form approved by the Commandant, sufficient information.

(a) To enable the master to load and ballast the vessel in a manner that avoids unacceptable stresses in the vessel's structure; and

(b) To guide the master as to the stability of the ship under varying conditions of service.

§ 45.107 Strength of hull.

The general structural strength of the hull must be sufficient for the draught corresponding to the freeboard assigned and must be approved by the Commandant. Ships built and maintained in conformity with the requirements of a classification society may be recognized by the Commandant as possessing adequate strength.

§ 45.109 Strength of superstructures and deckhouses.

Each superstructure or deckhouse used for accommodations of the crew must be approved by the Commandant or the approved assigning authority with regard to general strength and weathertightness. The Commandant may use the requirements of the assigning authority as a guide.

§ 45.111 Strength of bulkheads at ends of superstructures.

Bulkheads at ends of enclosed superstructures must have sufficient strength to withstand impact of boarding seas.

§ 45.113 Access openings in bulkheads at ends of enclosed superstructures.

(a) Access openings in bulkheads at ends of enclosed superstructures must have doors of steel or material as strong as steel that are permanently attached to the bulkhead and framed, stiffened, and fitted so that the bulkhead and door are as strong as the bulkhead and weather tight when closed.

(b) The means for securing the doors weathertight must be permanently attached to the doors or bulkheads and arranged so that the doors can be secured weathertight from both sides of the bulkhead.

(c) Access openings in bulkheads at ends of enclosed superstructures must have sills that are at least 12 inches above the deck.

§ 45.115 Bulwarks and guardrails.

(a) The exposed parts of freeboard and superstructures decks and deckhouses on the freeboard deck must have guardrails or bulwarks that are at least 36 inches high above the deck.

(b) Guardrails must have at least three courses with no more than a 9-inch opening below the lowest course and no more than 15 inches between other courses. If the sheer strake projection is at least 8 inches above the deck, a guardrail may have two courses with no more than 15 inches between courses.

(c) In way of trunks at least half the protection required by paragraph (a) of this section must be in the form of open rails.

§ 45.117 Freeing port area: General.

(a) Where bulwarks on the weather portions of freeboard or superstructure decks form wells, the bulwarks must have the area prescribed in this section and §§ 45.119 and 45.121 for rapidly freeing and draining the decks of water.

(b) Except as required in §§ 45.119 and 45.121 the minimum freeing port area in square feet on each side of the ship for each well on the freeboard deck and on the raised quarterdeck must be at least as great as A in the following formulas:

(1) Where the length of bulwark (*l*) in the well is 66 feet or less,

$$A=7.6+0.115\ (l)$$

(2) Where (*l*) exceeds 66 feet,

$$A=0.23\ (l)$$

but (*l*) need in no case be taken as greater than 0.7L.

(c) In ships having erections on deck that are open at either or both ends, provision for freeing the space within such erections must be approved by the Commandant or the assigning authority.

(d) The lower edges of the freeing ports must be as near the deck as practicable. Two-thirds of the freeing port area required must be provided in the half of the well nearest the lowest point of the sheer curve.

(e) All freeing port openings in the bulwarks must be protected by rails or bars spaced approximately 9 inches. If shutters are fitted to freeing ports, ample clearance must be provided to prevent jamming. Hinges must have pins or bearings of noncorrodible material. If shutters are fitted with securing appliances, these appliances must be of approved construction.

(f) The minimum freeing port area for each well on superstructure decks must be one-half of the area required by paragraph (b) of this section.

§ 45.119 Freeing port area: Changes from standard sheer.

The freeing port area required by § 45.117(b) must be multiplied by the factor in the following table 5 if the sheer differs from the standard sheer defined in § 45.63. Table 4.

TABLE 5

Freeing port area: Sheer correction.

Ratio of sums of actual sheer ord./std. sheer ord. Greater than:	Multiplier for area required by § 45.117(b)
1.0	1.0
1.0	1.00
0.9	1.05
0.8	1.10
0.7	1.15
0.6	1.20
0.5	1.25
0.4	1.30
0.3	1.35
0.2	1.40
0.1	1.45
No sheer	1.50

§ 45.121 Freeing port area: Changes for trunks and side coamings.

If a vessel has a trunk and does not meet the requirements of § 45.61 or has continuous or substantially continuous hatchway side coamings between detached superstructures, the minimum area of the freeing port openings must be obtained from the following table:

Breadth of hatchway or trunk in relation to the breadth of ship	Area of freeing ports in relation to the total area of the bulwarks (percent)
40 percent or less	20
75 percent or more	10

The area of freeing ports at intermediate breadths must be obtained by linear interpolation.

§ 45.123 Freeing port area: Changes for bulwark height.

(a) For the purposes of freeing port area only, bulwark height is considered standard at 24 in for ships 240 ft in length and less; and 48 in for ships 480 ft in length or greater. The standard bulwark height for ships of intermediate length is obtained by direct interpolation.

(b) If the bulwark is more than standard height, the area required by § 45.117 must be increased by 0.04 square feet per foot (ft^2/ft) of length of well for each foot difference in height.

(c) For ships greater than 480 ft in length that have an average bulwark height less than 3 ft, the area required by § 45.117 may be decreased by 0.04 ft^2/ftof length for each foot difference in height.

§ 45.125 Crew passageways.

The vessel must have means for protection of the crew from boarding seas such as life lines, gangways, and underdeck passages to facilitate passing between their quarters and machinery spaces and other spaces essential to the operation of the ship.

§ 45.127 Position of structures, openings, and fittings.

For the purposes of this Part—

(a) "Position 1" means in an exposed position on—

(1) The freeboard deck or a raised quarter deck;

(2) A superstructure deck or a trunk deck and forward of a point ¼ *L* from the forward perpendicular; or

(3) A trunk deck whose height is less than H_s.

(b) "Position 2" means—

(1) On a superstructure deck aft of a point ¼ *L* abaft the forward perpendicular; or

(2) On a superstructure and trunk combination, that is H_s or more n height, aft or a point ¼ *L* abaft the forward perpendicular.

§ 45.129 Hull fittings: General.

Hull fittings must be securely mounted in the hull so as to avoid increases in hull stresses and must be protected from local damage caused by movement of equipment or cargo.

§ 45.131 Ventilators.

(a) Ventilators passing through superstructures other than enclosed superstructures must have coamings of steel or equivalent material at the freeboard deck.

(b) Ventilators in position 1 must have coamings at least 30 in. above the deck and ventilators in position 2 must have coamings at least 24 in. above the deck. The Commandant or the assigning authority may also require coamings in other exposed positions.

(c) Ventilators in position 1 or 2 to spaces below freeboard decks or decks of enclosed superstructures or trunks must have coamings of steel permanently connected to the deck and any ventilator coaming that is more than 36 in. high must be specially supported.

(d) Except as provided in paragraph (e) of this section ventilator openings must have weathertight closing appliances that are permanently attached or, where approved by the Commandant or the assigning authority conveniently stowed near the ventilators to which they are to be fitted.

(e) Ventilators in position 1, the coamings of which extend to more than 12.5 ft above the deck, and in position 2, the coamings of which extend to more than 6 ft above the deck, need not have closing appliances unless specifically required by the Commandant.

§ 45.133 Air pipes.

(a) Where an air pipe to any tank extends above the freeboard or superstructure deck—

(1) The exposed part of the air pipe must be made of steel and of sufficient thickness to avoid breaking from impact of boarding seas.

(2) The air pipe must have a permanently attached means of closing its opening; and

(3) The height from the deck to any point where water may obtain access below deck must be at least 30 in

above the freeboard deck, 24 in above raised quarter decks, and 12 in above other superstructure decks.

(b) If the height required in paragraph (a) of this section interferes with working the ship, the Commandant may approve a lower height after considering the closing arrangements.

§ 45.135 Hull openings at or below freeboard deck.

Closures for hull openings at or below the freeboard deck must be as strong as the structure to which they are attached and must be watertight.

§ 45.137 Cargo ports.

(a) Unless otherwise authorized by the Commandant, the lower edge of any opening for cargo, personnel, machinery access, or similar opening in the side of a ship must be above a line that is drawn parallel to the freeboard deck at side and has as its lowest point the upper edge of the uppermost loadline.

(b) The number of cargo ports in the sides of a ship must be—

(1) No more than the minimum necessary for working the ship; and

(2) Approved by the Commandant.

§ 45.139 Side scuttles.

(a) The sill of each side scuttle must be above a line that is drawn parallel to the freeboard deck at side having its lowest point 2.5 percent of the breadth or 20 in above the summer load waterline, whichever is higher.

(b) Side scuttles to spaces below the freeboard deck or to spaces within enclosed superstructures shall be fitted with hinged inside deadlights arranged so that they can be secured watertight.

§ 45.141 Manholes and flush scuttles.

Manholes and flush scuttles in position 1 or 2 or within any superstructure other than an enclosed superstructure must have permanently attached covers, unless the cover is secured by closely spaced bolts around its entire perimeter.

§ 45.143 Hull openings above freeboard deck.

Closures for openings above the freeboard deck must be as strong as the structure to which they are attached and must be weathertight.

§ 45.145 Hatchway covers.

(a) Hatchways in position 1 and 2 must have weathertight hatch covers with gaskets and clamping devices.

(b) The maximum ultimate strength of the hatchway cover material must be at least 4.25 times the maximum stress in the structure calculated with the following assumed loads:

(1) For ships 350 ft or more in length, at least 250 $\mathrm{lb/ft}^2$ in position 1 and 200 $\mathrm{lb/ft}^2$ in position 2.

(2) For ships less than 350 ft in length, at least *AL* in the following formula:

(i) Position 1:

$$AL=200+C$$

where $C=50$

$$(L-79)/271$$

(ii) Position 2:

$$Al=150+C$$

(c) Hatchway covers must be so designed as to limit the deflection to not more than 0.0028 times the span under the loads described in paragraph (b) of this section and the thickness of mild steel plating forming the tops of covers must be at least 1 percent of the spacing of stiffeners or 0.24 in, whichever is greater.

§ 45.147 Hatchway coamings.

(a) Except where the Commandant determines that the safety of the vessel will not be impaired in any sea condition, each hatchway must have a coaming that is at least—

(1) 18 inches in position 1; and

(2) 12 inches in position 2.

(b) Each hatchway coaming required by this section must be made of steel or equivalent material.

(c) The height of these coamings may be reduced or omitted if the Commandant is satisfied that safety of the ship is not thereby impaired in any sea conditions.

§ 45.149 Machinery space openings.

(a) Machinery space openings in position 1 or 2 must be framed and enclosed by steel casings, and where the casings are not protected by other structures that meet the requirements of § 45.109, their strength must be approved by the Commandant or the assigning authority.

(b) Access openings in casings required by paragraph (a) of this section must have doors complying with the requirements of § 45.113. Other openings in such casings shall be fitted with equivalent covers, permanently attached.

(c) Except as provided in paragraph (d) of this section, coamings of any funnel or machinery space ventilator that must be kept open for the essential operations of the ship must—

(1) In position 1, extend at least 12.5 ft above the deck; and

(2) In position 2, extend at least 6 ft above the deck.

(d) The Commandant may approve a lesser height for protected coamings.

(e) Coamings of any fiddley or skylight over a machinery space opening in the freeboard or superstructure deck or the top of a deckhouse on the freeboard deck, must have covers of steel permanently attached and capable of being secured weathertight.

§ 45.151 Other openings.

Each opening other than hatchways, machinery space openings, manholes, or flush scuttles—

(a) In freeboard decks, must be protected by an enclosed superstructure or by a deckhouse or companionway that is equal in strength and weathertightness to an enclosed superstructure; or

(b) In exposed superstructure decks or in the top of a deckhouse on freeboard decks that gives access to a space below the freeboard deck or a space within an enclosed superstructure, must be protected by a deckhouse or companionway.

§ 45.153 Through-hull piping: General.

(a) All through-hull pipes required by this subpart must be made of steel or material equivalent to the hull in strength and fatigue resistance.

(b) All valves used as shell fittings and all shell fittings on which such valves are mounted must be made of steel, or bronze or other ductile material approved by the Commandant.

§ 45.155 Inlets and discharge piping: Valves.

(a) Except as provided in paragraphs (d) and (e) of this section each pipe that discharges overboard through the hull of the ship must have—

(1) An automatic nonreturn valve with a positive means for closing; or

(2) Two automatic nonreturn valves with the inboard valve accessible for examination in service.

(b) The means for operating a valve described by paragraph (a)(1) of this section must be readily accessible and have indicators that show when the valve is not closed.

(c) If the pipe discharges from a space that is not manned or does not have continuous bilge water monitoring, a valve described in paragraph (a)(1) of this section must be operable above the freeboard deck.

(d) Each pipe that discharges from a space within an enclosed superstructure or deckhouse may have at least one accessible automatic nonreturn valve if the space is regularly visited by the crew.

(e) Through-hull piping systems in machinery spaces may have valves with positive means for closing at the shell if the controls are readily accessible and have indicators showing when the valves are not closed (nonreturn valves are not required).

§ 45.157 Scuppers and gravity drains.

Scuppers and gravity deck drains from spaces above the freeboard deck that penetrate the shell below a line 24" or .05B above the summer loadline, whichever is greater, must have an automatic nonreturn valve. This valve may be omitted if the piping is of thickness not less than extra heavy pipe.

§ 45.159 Special conditions of assignment for type A vessels.

The lower freeboards allowed for type A vessels allow water on deck for greater percentages of time. Therefore the following additional requirements must be met to qualify for type A freeboards:

(a) Machinery casings must be protected by an enclosed superstructure or deckhouse unless intact bulkheads are used on all sides on the freeboard deck.

(b) Exposed machinery casings may be fitted with weathertight doors providing they lead to a space or passageway as strong as an enclosed superstructure from which a second interior weathertight door is provided for access to the engine room.

(c) Hatchways on the exposed freeboard or forecastle decks must be provided with watertight covers of steel.

(d) Unless a separate fore and aft access is provided below the freeboard deck, a permanent fore and aft gangway must be fitted at the superstructure deck level between poop and all other deckhouses used in the essential operation of the vessel.

(e) Type "A" vessels must be fitted with open rails for at least half the length of the exposed parts of the weather deck. Where superstructures are connected by trunks, open rails must be fitted for the whole length of the exposed parts of the freeboard deck.

(Sec. 2, 45 Stat. 1493, as amended, sec. 2, 49 Stat. 888, as amended, sec. 6(b)(1), 80 Stat. 937; 46 U.S.C. 85a, 88a, 49 U.S.C. 1655(b)(1); 49 CFR 1.46(b))

Appendix A—Load Line Certificate Form

GREAT LAKES LOAD LINE CERTIFICATE

No. ——

Issued under the authority of the Commandant, U.S. Coast Guard, United States of America, under the provisions of the Act of August 27, 1935, as amended to establish load lines on the Great Lakes of North America and the Load Line regulations in force on ————, 19—, By ————————————, duly authorized by the Commandant to issue said load line certificate.

Ship ————————————————

Certificate No. ————————————

Official No ——————————————

Length (LBP) ——————————————

Gross tonnage ——————————————

Port of registry ——————————————

Type of Ship:

TYPE "A"
TYPE "B"
TYPE "B" with increased freeboard

FREEBOARD FROM DECK LINE

Midsummer	MS
Summer	S
Intermediate	I
Winter	W

LOAD LINE

....	above S
Upper edge of line through center of diamond	
	below S
	below S

Increase for salt water for all freeboards —— inches.

The upper edge of the deck line from which these freeboards are measured is —— inches above or below the top of the ——— deck at side.

This is to certify that this ship has been surveyed and the freeboards and load lines shown above have been found to be correctly marked upon the vessel in manner and location as provided by the load line regulations of the Commandant, U.S. Coast Guard, applicable to the Great Lakes.

This certificate[1] remains in force until ————. Issued at ———— on the —— day of ————, 19—. (Here follows the signature, seal, if any, and the name of the authority issuing the certificate.)

NOTES

(1) In accordance with the Great Lakes Load Line Regulations the diamond and lines must be permanently marked. The "MS" loadline shall be assigned only to those particular vessels that qualify under the regulations.

(2) The "SW" marks need only be assigned to Great Lakes vessels loading in salt water of the St. Lawrence River west of a straight line from Cap de Rosiers to West Point Anticosti Island, and west of a line along longitude 63 degrees west from Anticosti Island to the north shore of the St. Lawrence River. In such cases these limits shall be indicated on the certificate.

(3) The load line assignment given by this certificate necessarily assumes that the nature and stowage of cargo, ballast, etc., are such as to secure sufficient stability for the vessel. Accordingly, it is the owner's responsibility to furnish the Master of the vessel with stability information and instructions when this is necessary to maintenance of sufficient stability.

(On the reverse side of the load line certificate, or on a separate sheet, attached and forming part of the certificate, provision is to be made for annual inspection and renewal endorsements.)

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[1] Upon the expiration of the certificate, renewal must be obtained as provided by the Great Lakes Load Line Regulations and the certificate so endorsed.

PART 46—SUBDIVISION LOAD LINES FOR PASSENGER VESSELS

Subpart 46.01—Authority and Purpose

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46.10-50 Drills and inspections.
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46.10-60 Control.
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Subpart 46.15—Subdivision Load Lines for Passenger Vessels Engaged in Foreign, Coastwise, and Great Lakes Voyages

46.15-1 Procedure for determination of subdivision load line.
46.15-5 Engineering requirements.
46.15-10 Subdivision load lines.

AUTHORITY: Sec. 2, 45 Stat. 1493, as amended, sec. 2, 49 Stat. 888, as amended, sec. 6(b)(1), 80 Stat. 938; 46 U.S.C. 85a, 88a, 49 U.S.C. 1655(b); 49 CFR 1.46(b) (35 FR 4959). Interpret or apply R.S. 4490, as amended, sec. 3, 24 Stat. 129, as amended, 41 Stat. 305, as amended, sec. 5, 49 Stat. 1384, as amended, secs. 1, 2, 49 Stat. 1544, 1545, as amended, sec. 3, 54 Stat. 347, as amended, sec. 3, 68 Stat. 675; 46 U.S.C. 482, 483, 363, 369, 367, 1333, 50 U.S.C. 198; E.O. 11239, July 31, 1965, 30 FR 9671, 3 CFR, 1965 Supp.

SOURCE: CGFR 65-50, 30 FR 16769, Dec. 30, 1965, unless otherwise noted.

Subpart 46.01—Authority and Purpose

§ 46.01-1 Purpose.

(a) The purpose of the regulations in this Part is to set forth uniform minimum requirements applicable to passenger vessels required to have subdivision load lines. These requirements deal with the following:

(1) Load line requirements applicable before a passenger vessel will be marked with and certificated as to subdivision load lines.

(2) Assigning, marking, and recording of subdivision load lines.

(3) Administration of subdivision load lines.

(4) Application of requirements to passenger vessels.

§ 46.01-5 Authority.

(a) The regulations regarding subdivision and subdivision load lines interpret or apply Title 46, U.S. Code, sections 85a, 88a, 363, 367, 369, 482, 483, and 1333, and Title 50, U.S. Code, section 198.

(b) The International Convention on Load Lines, 1966 and the applicable International Convention for Safety of Life at Sea, also establish minimum requirements for load lines and subdivision.

[CGFR 65-50, 30 FR 16769, Dec. 30, 1965, as amended by CGFR 68-60, 33 FR 10077, July 12, 1968]

§ 46.01-15 Application of regulations.

(a) The regulations in this Part establish subdivision load lines required on passenger vessels engaged in foreign voyages, as well as on passenger vessels of 150 gross tons or over engaged in coastwise or Great Lakes voyages.

(b) When engaged in voyages subject to this Part, no passenger vessel required to be marked with subdivision load lines shall depart from or arrive at any port or place under the jurisidiction of the United States, nor shall such United States vessel operate on the high seas nor the Great Lakes, unless such vessel has been marked with subdivision load lines in accordance with the regulations in this Part, has on board a valid certificate certifying to the correctness of the location of such subdivision load line marks, and is otherwise in compliance with the applicable requirements of law and regulations in this Part.

(c) No passenger vessel of the United States of 150 gross tons or over and subject to the Coastwise Load Line Act, 1935, as amended, shall engage in coastwise voyages or voyages on the Great Lakes unless such vessel has been marked with subdivision load lines in accordance with the regulations in this Part and has on board a valid certificate certifying to the correctness of the location of such subdivision load line marks.

(d) No foreign passenger vessel belonging to a country that has ratified or acceded to the applicable International Convention for Safety of Life at Sea shall arrive or depart from any port or place under the jurisdiction of the United States, and no foreign passenger vessel of 150 gross tons or over subject to the Act of March 2, 1929, as amended (46 U.S.C. 85-85g), or the Coastwise Load Line Act, 1935, as amended (46 U.S.C. 88-88i), shall arrive or depart from any port or place under the jurisdiction of the United States, including ports on the Great Lakes, unless such passenger vessel has been marked with subdivision load lines in accordance with the regulations in this Part and has on board a valid certificate certifying to the correctness of the location of such subdivision load line marks.

(e) Subdivision load lines shall be marked on both sides of passenger vessels where determined and in a manner described in Subpart 46.15 as applicable to the vessel's service. The subdivision load line certificates shall be in accordance with §§ 46.10-30 and 46.10-35.

§ 46.01-20 Penalties for violations.

(a) Penalties for violations of the regulations in this Part by passenger vessels of the United States engaged in foreign voyages shall be in accordance with those laws which require the inspection and certification of the vessel. In addition, for passenger vessels of 150 gross tons or over and subject to either the Act of March 2, 1929, as amended (46 U.S.C. 85-85g), or the Coastwise Load Line Act, 1935, as amended (46 U.S.C. 88-88i), which engage in voyages described in § 42.03-5, § 42.03-10, or § 45.01-1, the penalties for violations of the regulations in this Part shall be those set forth in the load line act applicable to the vessel.

(b) For a further description of the actions which may be taken see § 42.07-50, of this subchapter. The procedures governing the assessment, collection, remission and mitigation of any monetary penalty imposed for a violation of a law or the regulations prescribed thereunder in this Part, as well as the appeal procedures followed, are in Subpart 2.50 of Part 2 of Subchapter A (Procedures Applicable to the Public) of this chapter.

[CGFR 65-50, 30 FR 16769, Dec. 30, 1965, as amended by CGFR 68-60, 33 FR 10077, July 12, 1968]

Subpart 46.05—Definitions Used in This Part

§ 46.05-1 Passenger vessel.

(a) For the purpose of the regulations in this Part, a vessel is a passenger vessel if:

(1) Engaged on an international voyage by sea, it carries or is authorized to carry more than 12 passengers; or,

(2) Engaged on a coastwise voyage by sea or a voyage on the Great Lakes, it carries or is authorized to carry more than 16 persons in addition to the crew.

§ 46.05-10 Foreign voyage.

(a) A foreign voyage for the purpose of marking passenger vessels with subdivision load lines is a voyage by sea between a port under the jurisdiction of the United States and a port of a foreign country, its colonies, territories, or protectorates, or conversely (a voyage exclusively on the Great Lakes excepted).

§ 46.05–15 Coastwise voyages.

(a) A coastwise voyage by sea, for the purpose of marking passenger vessels with subdivision load lines, is a voyage in which a vessel in the usual course of her employment proceeds from one port or place in the United States to another port or place in the United States or from a port or place in a possession to another port or place in the same possession, and passes outside the line dividing inland waters from the high seas (a voyage exclusively on the Great Lakes excepted), as well as a voyage in which a vessel proceeds from a port or place in the United States or her possessions and passes outside the line dividing inland waters from the high seas and navigates on the high seas, and then returns to the same port or place.

§ 46.05–20 Great Lakes voyage.

A Great Lakes voyage is any voyage from a United States port or place on the Great Lakes to another United States port or place on the Great Lakes or to a Canadian port or place on the Great Lakes, or conversely.

§ 46.05–25 New passenger vessel.

A new passenger vessel is a vessel whose keel was laid or was a vessel converted into a passenger vessel on or after May 26, 1965.

[CGFR 65-50, 30 FR 16769, Dec. 30, 1965, as amended by CGFR 68-60, 33 FR 10077, July 12, 1968]

§ 46.05–30 Existing passenger vessel.

An existing passenger vessel in respect to its voyage is any passenger vessel that is not a new passenger vessel as defined in § 46.05–25.

Subpart 46.10—Administration

§ 46.10–1 Relaxation from regulations.

(a) New passenger vessels making foreign voyages by sea shall comply with the requirements in this Part. An existing passenger vessel engaged in foreign voyages by sea may be permitted relaxation from the requirements of this Part if, in the opinion of the Commandant, U.S. Coast Guard, such requirements are unreasonable or impracticable.

(b) A new passenger vessel making coastwise voyages by sea or making Great Lakes voyages shall comply with the requirements in this Part. An existing passenger vessel making coastwise voyages by sea or Great Lakes voyages may be permitted relaxation from the requirements of this Part if, in the opinion of the Commandant, U.S. Coast Guard, such requirements are unreasonable or impracticable.

§ 46.10–5 Load line requirements for subdivision.

(a) The load line requirements of Parts 42, 44, 45 of this subchapter as applicable to the passenger vessel and her service, shall be complied with before a passenger vessel will be marked with and certificated as to subdivision load lines.

[CGFR 65-50, 30 FR 16769, Dec. 30, 1965, as amended by CGFR 68-60, 33 FR 10077, July 12, 1968]

§ 46.10–10 Marks to indicate subdivision load lines.

(a) Marks to indicate the maximum mean draft to which a passenger vessel may be lawfully submerged shall be permanently marked on each side of the passenger vessel in the form, manner, and location provided in this Part.

(b) The Commandant, U.S. Coast Guard, shall determine the position of the subdivision load lines by the application of the requirements contained in this Part and Parts 73 and 74 of Subchapter H (Passenger Vessels) of this chapter. The correct marking of subdivision load lines on passenger vessels shall be certified to by the American Bureau of Shipping as a classification society approved by the Commandant for such purpose.

(c) Certificates certifying to the correctness of subdivision load line marks shall not be furnished until it is determined that the marks have been correctly placed upon the passenger vessel.

(d) In the case of passenger vessels that are required by the International Convention for Safety of Life at Sea to have on board a safety certificate, the certification of subdivision, load line marks shall be made by letter to the Commandant, U.S. Coast Guard, Washington, D.C. 20591.

[CGFR 65-50, 30 FR 16769, Dec. 30, 1965, as amended by CGFR 68-60, 33 FR 10077, July 12, 1968]

§ 46.10-15 Survey for the establishment and renewal of subdivision load line marks.

(a) Every passenger vessel to be marked with and certificated for subdivision load lines must comply with the requirements as set forth in Subchapter H (Passenger Vessels) of this chapter for ocean, coastwise, and Great Lakes service as applicable to the particular vessel and the service in which she is to be employed.

(b) Every passenger vessel marked with a subdivision load line shall be subjected to the surveys specified in this paragraph. The details of the surveys or inspections indicated in paragraphs (b)(1) through (3) of this section shall be as set forth in the applicable sections of Part 71 of Subchapter H (Passenger Vessels) of this chapter.

(1) A survey before the vessel is put in service.

(2) A periodical survey once every 12 months.

(3) Additional surveys as occasion arises.

(4) Surveys required by Parts 42, 44, or 45 of this subchapter.

[CGFR 65-50, 30 FR 16769, Dec. 30, 1965, as amended by CGFR 68-60, 33 FR 10077, July 12, 1968]

§ 46.10-20 Application for the assignment and renewal of subdivision load lines.

(a) Application for assignment and renewal of subdivision load lines and certification thereof shall be made in writing to the Commandant, U.S. Coast Guard, Washington, D.C. 20591.

[CGFR 65-50, 30 FR 16769, Dec. 30, 1965, as amended by CGFR 68-60, 33 FR 10077, July 12, 1968]

§ 46.10-25 Equivalents.

(a) Where in the regulations in this Part it is provided that a particular fitting, appliance, apparatus, or type thereof, shall be fitted or carried in a vessel engaged on foreign voyages by sea or that any particular arrangement shall be adopted, there may be substituted any other fitting or appliance or type thereof or any other arrangement provided that the Commandant, U.S. Coast Guard, shall have been satisfied by suitable trials that the fitting, appliance, or apparatus, or type thereof, or that the arrangement substituted is at least as effective as that specified in this Part.

(b) Where, in the application of the regulations in this Part to passenger vessels engaged in coastwise voyages by sea and on Great Lakes voyages, it is desired to substitute other construction, arrangement, fitting, or appliance, or type thereof, such substitution may be made if approved by the Commandant, U.S. Coast Guard, provided the degree of safety provided by this Part is obtained.

§ 46.10-30 Subdivision load line certificates.

(a) Passenger vessels engaged in foreign voyages by sea shall have their subdivision load lines certified on the safety certificate required by the International Convention for Safety of Life at Sea, 1960. Safety certificates shall be issued by the Commandant, U.S. Coast Guard, Washington, D.C. 20591, for a period not to exceed one year. These vessels will also be provided with the load line certificate required by Part 42 of this subchapter, the minimum freeboard shown thereon to be not less than the minimum freeboard corresponding to the principal passenger condition. The fact that they are subdivision load lines is to be noted on the load line certificate.

(b) Passenger vessels engaged on coastwise voyages by sea or Great Lakes voyages shall have the position of their subdivision load lines recorded on a load line certificate in the form required by Parts 42 or 45 of this subchapter. The fact that they are subdivision load lines is to be noted on the load line certificate.

(c) A note shall be added to the load line certificate below the signature of the assigning—authority in the following form:

The bulkhead deck used for determining the position of the subdivision load lines

certified above is ——————————
(here described bulkhead deck).

(d) Annual inspections of passenger vessels shall be as required by §§ 43.01-55 and 46.10-15 of this subchapter and renewal of passenger vessels' load line certificates shall be as required by §§ 42.09-15 and 42.09-20.

(e) Each new passenger vessel which receives its first load line certificate shall also be provided with a copy of the load line survey report as required by §§ 42.09-1(c) or 45.01-30 of this subchapter.

[CGFR 65-50, 30 FR 16769, Dec. 30, 1965, as amended by CGFR 68-60, 33 FR 10077, July 12, 1968; CGFR 68-126, 34 FR 9019, June 5, 1969]

§ 46.10–35 Validity of subdivision load line certificates.

(a) Subdivision load line certificates issued to passenger vessels shall only be valid during the time for which the certificates are issued.

(b) If, due to any cause, the conditions as required by this Part are changed, or the regulations in this Part are not carried out, the load line certificate may be cancelled and the load lines considered nonexistent: *Provided*, That if the conditions causing the cancellation of the certificate are satisfactorily corrected, the load line certificate shall be reinstated for the remainder of its term.

(c) A valid subdivision load line certificate for foreign voyages by sea shall be valid for coastwise voyages by sea and Great Lakes voyages. A valid subdivision load line certificate for coastwise voyages by sea shall be valid for Great Lakes voyages but not for foreign voyages by sea. A valid subdivision load line certificate for Great Lakes voyages shall not be valid for foreign or coastwise voyages by sea.

§ 46.10–40 Nonsubmergence subdivision load line (Great Lakes).

(a) Passenger vessels on the Great Lakes of 150 gross tons or over shall not submerge the subdivision load line applicable to the voyage.

§ 46.10–45 Nonsubmergence subdivision load lines in salt water.

(a) Passenger vessels required to be marked with subdivision load lines, engaged on foreign and coastwise voyages other than the Great Lakes voyages, shall not submerge in salt water the subdivision load line applicable to the voyage. Passenger vessels engaged on ocean, foreign or coastwise voyages may be marked with fresh water load lines. A passenger vessel on foreign or coastwise voyages (except Great Lakes voyages) may have an allowance made for the degree of brackishness of the water in which the vessel is floating but not for the weight of fuel, water, etc., required for consumption between the point of departure and the open sea, and no allowance is to be made for bilge or ballast water that may be in the passenger vessel at the time of departure.

§ 46.10–50 Drills and inspections.

(a) For the required drills and inspections to be conducted on passenger vessels, see Subpart 78.17 of Subchapter H (Passenger Vessels) of this chapter.

§ 46.10–55 Logbook entries.

(a) For required logbook entries to be made on passenger vessels, see Subpart 78.17 of Subchapter H (Passenger Vessels) of this chapter.

§ 46.10–60 Control.

(a) The District Director of Customs or the Coast Guard District Commander may detain a passenger vessel for a survey if there is reason to believe that such a vessel is proceeding on her journey in excess of the draft allowed by the regulations in this Part as indicated by the vessel's load lines certified on the safety certificate, load line certificate, or otherwise. The Coast Guard District Commander may detain a passenger vessel if it is so loaded as to be manifestly unsafe to proceed to sea. Except as otherwise required by this section, § 42.07-60 if this subchapter applies to all passenger vessels assigned load lines under the load line acts and the regulations of this subchapter.

[CGFR 68-126, 34 FR 9019, June 5, 1969]

§ 46.10–65 Construction.

(a) The watertight subdivision of every passenger vessel shall be as efficient as possible, having regard to its intended service. This principle is given effect by the requirements of Part 73 of Subchapter H (Passenger Vessels) of this chapter which provide for variations in the standard of subdivision according to the length of the vessel and the degree to which the vessel approaches the exclusive passenger type, the highest standard being required in vessels of the greatest length engaged primarily in the carriage of passengers.

(b) Passenger vessels engaged in foreign voyages by sea or coastwise voyages by sea or voyages on the Great Lakes, to be marked with subdivision load lines shall comply with the requirements in this Part.

§ 46.10-70 Plans and inspections of new and converted vessels.

(a) Plans for a new passenger vessel or a vessel to be converted to a passenger vessel shall be submitted to the Commandant as required by Subpart 71.65 of Subchapter H (Passenger Vessels) of this chapter.

(b) Inspections shall be made during the construction or conversion of the vessel as required by Subpart 71.20 of Subchapter H (Passenger Vessels) of this chapter.

(c) Upon completion of the construction or conversion of a passenger vessel, a stability test shall be performed and stability information shall be supplied to the operator as required by Part 74 of Subchapter H (Passenger Vessels) of this chapter.

Subpart 46.15—Subdivision Load Lines for Passenger Vessels Engaged in Foreign, Coastwise, and Great Lakes Voyages

§ 46.15-1 Procedure for determination of subdivision load line.

(a) The procedure for the determination of the subdivision load line as well as special construction features of the vessel shall be as set forth in Subpart 72.01 and Parts 73 and 74 of Subchapter H (Passenger Vessels) of this chapter.

§ 46.15-5 Engineering requirements.

(a) Bilge and ballast systems, piping, inlets and discharges, ash chutes, astern power, and auxiliary steering shall be in accordance with the provisions of Subchapter F (Marine Engineering) of this chapter.

§ 46.15-10 Subdivision load lines.

(a) Subdivision load lines shall be located by measuring vertically down from the deck line required by Part 42 of this subchapter.

(b) The length, width, and manner of marking the lines shall be as provided in Subpart 42.13 of this subchapter.

(c) No subdivision load line is to be placed so that the freeboard is reduced from that determined by the highest seasonal mark permitted by Part 42.

(d) When the highest subdivision load line is located on a vessel used as a passenger vessel in a position between the highest and lowest seasonal load line marks, the seasonal load line marks above the subdivision load line will be omitted and those below will be marked.

(e) When the freeboard from the highest subdivision load line on a vessel used as a passenger vessel is greater than the freeboard from the lowest load line permitted by Part 42 of this subchapter, the load lines required by Part 42 of this subchapter shall be omitted and the disk with its horizontal line located in line with the highest subdivision load line.

(f) One fresh water line shall be marked. When a subdivision and a normal load line are combined, the normal fresh water line only shall be used unless the position of the subdivision load line is such that confusion will result, in which case a subdivision fresh water line may be used, marked FC, and the normal fresh water line omitted.

(g) Subdivision load lines shall be aft of the vertical line. The vertical line shall be extended as necessary to connect the lowest and highest load lines marked on the vessel.

(h) When a vessel has spaces used for cargo and passengers alternatively so that the position of the subdivision load line varies with the service, subdivision load lines for the principal passenger condition shall be marked and denoted by C_1 and the alternative conditions marked and denoted by C_2, C_3, etc. The position of each load line and the conditions under which a particular load line is applicable shall be noted in the certificate.

(i) The principal passenger condition for a vessel having spaces used for passengers and cargo alternatively is the condition where only those spaces appropriated exclusively to passengers are taken into consideration for determination of the subdivision load line.

(j) For Great Lakes vessels, references to Part 42 shall read Part 45 and a "diamond" shall be substituted for the "disk". No "fresh water" line will be marked.

[CGFR 65-50, 30 FR 16769, Dec. 30, 1965, as amended by CGFR 68-60, 33 FR 10077, July 12, 1968]

SUBCHAPTER F—MARINE ENGINEERING

PART 50—GENERAL PROVISIONS

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AUTHORITY: R.S. 4405, as amended, 4462, as amended, sec. 633, 63 Stat. 545, sec. 6(b)(1), 80 Stat. 938; 46 U.S.C. 375, 416, 14 U.S.C. 633, 49 U.S.C. 1655(b); 49 CFR 1.4 (a)(2), (f). R.S. 4399, as amended, 4400, as amended, 4417, as amended, 4417a, as amended, 4418, as amended, 4421, as amended, 4426-4431, as amended, 4433, as amended, 4434, as amended, 4453, as amended, 4488, as amended, 4491, as amended, sec. 14, 29 Stat. 690, as amended, sec. 10, 35 Stat. 428, as amended, 41 Stat. 305, as amended, secs. 1, 2. 49 Stat. 1544, 1545, as amended, sec. 17, 54 Stat. 166, as amended, sec. 3, 54 Stat. 347, as amended, sec. 3, 70 Stat. 152, sec. 3, 68 Stat. 675; 46 U.S.C. 361, 362, 391, 391a, 392, 399, 404-409, 411, 412, 435, 481, 489, 366, 395, 363, 367, 526p, 1333, 390b, 50 U.S.C. 198; E.O. 11239, July 31, 1965, 30 FR 9671, 3 CFR, 1965 Supp., unless otherwise noted.

SOURCE: CGFR 68-82, 33 FR 18808, Dec. 18, 1968, unless otherwise noted.

Subpart 50.01—Basis and Purpose of Regulations

§ 50.01-1 Authority for regulations.

(a) *General.* (1) The authority to prescribe regulations generally for vessel inspection and certification is set forth in 46 U.S.C., sections 375 and 416, and specifically in other provisions of the inspection laws. Under the provisions of 46 U.S.C., section 372, the Commandant, U.S. Coast Guard, superintends the administration of the vessel inspection laws, rules, and regulations, and is required to produce a correct and uniform administration of such requirements.

(2) The authority to prescribe regulations governing boilers, pressure vessels, machinery, including appurtenances, piping, etc., is set forth in 46 U.S.C., sections 391 to 393, inclusive, 395, 404 to 409, inclusive, 411 to 413, inclusive, 481 and 489. The authority to prescribe regulations for vessels with respect to marine engineering details is in 46 U.S.C., sections 361, 362, 363, 366, 367, 369, 390b, 391a, 395, 399, 435, 526p, and 1333, and 50 U.S.C., section 198.

(b) *Passenger vessels.* (1) The statement regarding authority to prescribe requirements for passenger vessels of 100 gross tons and over is in § 70.01-10, Subchapter H (Passenger Vessels), of this chapter.

(2) The statement regarding authority to prescribe requirements for passenger vessels under 100 gross tons is in § 175.01-1, Subchapter T (Small Passenger Vessels), of this chapter.

(c) *Cargo and miscellaneous vessels.* The statement regarding authority to prescribe requirements for cargo and miscellaneous vessels is in § 90.01-10, Subchapter I (Cargo and Miscellaneous Vessels), of this chapter.

(d) *Tank vessels.* The statement regarding authority to prescribe requirements for tank vessels is in § 30.01-1, Subchapter D (Tank Vessels), of this chapter.

(e) *Nautical schoolships.* The statements regarding authority to prescribe requirements for Nautical schoolships are in §§ 167.01-1 and 168.01-10, Subchapter R (Nautical Schools), of this chapter.

(f) *Steam motorboats.* The authority to prescribe requirements for the engine, boiler, or other operating machinery on all motorboats, which are more than 40 feet in length and which are propelled by machinery driven by steam, is in 46 U.S.C., section 526.

(g) *Nuclear vessels.* The general authority to prescribe requirements for nuclear vessels is in 14 U.S.C., sections 2 and 633, and 46 U.S.C., sections 2, 170, 363, 367, 369, 390b, 391a, 392, and 1333, and 50 U.S.C., section 198, as well as the 1960 International Convention for Safety of Life at Sea and Executive Order 11239 (30 FR 9671, 3 CFR, 1965 cum. supp.).

(h) *Oceanographic vessels.* The statement regarding authority to prescribe requirements for oceanographic Vessels with respect to boilers, pressure vessels, machinery, including appurtenances, piping, etc., is in § 188.01-10 Subchapter U (Oceanographic vessels) of this chapter. Under 46 U.S.C., sections 441 to 445, inclusive, the Coast Guard may find certain vessels as "* * * being employed exclusively in instruction in oceanography or limnology, or both, or oceanographic research * * *". By these laws such vessels "* * * shall not be considered a passenger vessel, a vessel carrying passengers, or a passenger carrying vessel under the laws relating to the inspection and manning of merchant vessels by reason of the carriage of scientific personnel." Also, such vessels "* * * shall not be deemed to be engaged in trade or commerce." However, those oceanographic vessels which are steam vessels, seagoing motor vessels of 300 gross tons and over, or seagoing barges of 100 gross tons and over are subject to the requirements of this subchapter.

(i) *Exemptions.* (1) Public vessels owned by the United States, other than those engaged in commercial service, are exempt from the regulations in this subchapter.

(2) Certain other vessels may be exempt from the regulations in this subchapter when such exemption is provided in the law governing such vessels.

(j) *Mobile offshore drilling units.* The citation regarding authority to prescribe requirements for mobile offshore units is in Subchapter IA of this chapter.

(Sec. 2, 87 Stat. 418 (46 U.S.C. 86); sec. 3, 82 Stat. 341, as amended (46 U.S.C. 367); R.S. 4405, as amended (46 U.S.C. 375); sec. 10, 35 Stat. 428 (46 U.S.C. 395); R.S. 4423, as amended (46 U.S.C. 400); R.S. 4429, as amended (46 U.S.C. 407); R.S. 4430, as amended (46 U.S.C. 408); 88 Stat. 423 (46 U.S.C. 411); R.S. 4434, as amended (46 U.S.C. 412); R.S. 4462, as amended (46 U.S.C. 416); sec. 1, 73 Stat. 475 (46 U.S.C. 481); sec. 4, 67 Stat. 462 (43 U.S.C. 1333(d)); sec. 6(b)(1), 80 Stat. 937 (49 U.S.C. 1655(b)(1)); 49 CFR 1.46(b) and (n)(6))

[CGFR 68-82, 33 FR 18808, Dec. 18, 1968, as amended by CGD 73-251, 43 FR 56799, Dec. 4, 1978]

§ 50.01-5 Assignment of functions.

(a) The Department of Transportation Act (Pub. L. 89-670, 80 Stat. 931-950, 49 U.S.C. 1651-1659), transferred to and vested in the Secretary of Transportation "* * * all functions, powers, and duties, relating to the Coast Guard of the Secretary of the Treasury and of other officers and offices of the Department of the Treasury" (subsection 6(b)(1), 49 U.S.C. 1655(b)). This transfer is subject to certain conditions, modifications, and exceptions as set forth in such act. By a rule in 49 CFR 1.4(a) the Secretary of Transportation delegated to the Commandant, U.S. Coast Guard, authority to exercise certain functions, powers, and duties as set forth in subsections 6(a)(4), 6(b)(1), and 6(g) of such act (49 U.S.C. 1655), subject to conditions, exceptions and modifications as described in 49 CFR Part 1. By a rule in 49 CFR 1.9 the Secretary of Transportation continued in effect actions taken prior to April 1, 1967.

(b) The Commandant, U.S. Coast Guard, in a notice dated March 31, 1967, and effective April 1, 1967 (32 FR 5611), approved the continuation of orders, rules, regulations, policies, procedures, privileges, waivers, and other actions, which had been made, allowed, granted, or issued prior to April 1, 1967, and provided that they shall continue in effect according to their terms until modified, terminated, repealed, superseded, or set aside by appropriate authority.

§ 50.01-10 Purpose of regulations.

(a) The purpose of the regulations in this subchapter is to set forth minimum requirements for marine engineering details for various types of vessels in accordance with the intent of title 52 of the Revised Statutes and acts amendatory thereof or supplemental thereto as well as to implement various international conventions for safety of life at sea and other treaties, which contain requirements affecting marine engineering. The regulations in this subchapter have the force of law.

(b) All marine engineering details, such as boilers, pressure vessels, nuclear pressure vessels, main and auxiliary machinery, piping, valves, and fittings, shall be designed, constructed, and installed in accordance with the provisions of this subchapter, except when specifically modified by the regulations in another subchapter in this chapter for a particular type of vessel or where a specific installation may be required or permitted.

§ 50.01-15 Scope of regulations.

(a) This subchapter provides the specifications, standards and requirements for strength and adequacy of design, construction, installation, inspection, and choice of materials for machinery, boilers, pressure vessels, safety valves, and piping systems upon which safety of life is dependent.

(b) Since this subchapter contains the marine engineering details, it implements the requirements for inspection and certification of vessels as set forth in other subchapters for specific types of vessels.

Subpart 50.05—Application

§ 50.05-1 General.

(a) The regulations in this subchapter shall apply to the marine engineering details of installations on vessels required to be inspected and certificated under other subchapters in this chapter as described in § 50.01-1.

(b) The regulations in this subchapter are not retroactive in effect, except as provided in § 50.05-5 or § 50.05-10, or if specifically so provided for at the time specific regulations are amended or added.

(c) The requirements in this subchapter revised or added subsequent to July 1, 1969, shall be applicable to the installations contracted for after the effective dates of such requirements. Normally, materials, items of equipment, or installations in vessels which have been accepted and passed as satisfactory and meeting the applicable requirements in this subchapter then in effect and which are maintained in good and serviceable condition to the satisfaction of the Officer in Charge, Marine Inspection, may be continued in use until replacement is deemed necessary by such officer or as specified in the regulations.

(d) Items of equipment, which are in use on vessels, previously approved by the Commandant but not complying with the latest specification requirements may be continued in use so long as they are maintained in good and serviceable condition to the satisfaction of the Officer in Charge, Marine Inspection, until replacement is deemed necessary by such officer or as specified in the regulations.

(e) Industrial systems and components on mobile offshore drilling units must meet § 54.01-16 and Subpart 58.60 of this chapter.

(Sec. 2, 87 Stat. 418 (46 U.S.C. 86); sec. 3, 82 Stat. 341, as amended (46 U.S.C. 367); R.S. 4405, as amended (46 U.S.C. 375); sec. 10, 35 Stat. 428 (46 U.S.C. 395); R.S. 4423, as amended (46 U.S.C. 400); R.S. 4429, as amended (46 U.S.C. 407); R.S. 4430, as amended (46 U.S.C. 408); 88 Stat. 423 (46 U.S.C. 411); R.S. 4434, as amended (46 U.S.C. 412); R.S. 4462, as amended (46 U.S.C. 416); sec. 1, 73 Stat. 475 (46 U.S.C. 481); sec. 4, 67 Stat. 462 (43 U.S.C. 1333(d)); sec. 6(b)(1), 80 Stat. 937 (49 U.S.C. 1655(b)(1)); 49 CFR 1.46(b) and (n)(6))

[CGFR 68-82, 33 FR 18808, Dec. 18, 1968, as amended by CGD 73-251, 43 FR 56799, Dec. 4, 1978]

§ 50.05–5 Existing boilers, pressure vessels or piping systems.

(a) Whenever doubt exists as to the safety of an existing boiler, pressure vessel, or piping system, the marine inspector may require that it be gaged or checked to determine the extent of deterioration, and if necessary for safety may require the recalculation and reduction of the maximum allowable working pressure.

(b) For the purpose of recalculating the maximum allowable working pressure of boilers, pressure vessels, or piping which have deteriorated in service, the applicable design formulas in effect at the time it was contracted for or built or the currently effective design formulas in this subchapter shall be used: *Provided*, That such recalculation based on currently effective design formulas in this subchapter does not permit a higher pressure than that originally allowed by the regulations in effect at the time such work was contracted for or built.

(c) When existing vessels are reboilered, the mountings and attachments shall be renewed in accordance with the regulations in this subchapter in effect at the time such reboilering work is contracted for. The existing steam piping shall be examined. Those portions which are in good condition and comply with minimum thickness requirements in effect at the time such reboilering work is contracted for may be continued in service. The steam piping replaced shall be in accordance with the regulations in this subchapter in effect for new construction.

§ 50.05–10 Alterations or repairs.

(a) When alteration or repair of boilers, pressure vessels, machinery, safety valves or piping systems becomes necessary, the work shall be done under the cognizance of the Officer in Charge Marine Inspection. It shall be done in accordance with the regulations in effect at the time such vessel or installation was contracted for or built (whichever is latest), or in accordance with the regulations in effect for new construction.

(b) When alterations or repairs are made to a U.S. flag vessel in a port or place not in the United States, a notice containing details of the proposed alterations or repairs must be submitted to the appropriate Officer in Charge, Marine Inspection.

(Sec. 2, 87 Stat. 418 (46 U.S.C. 86); sec. 3, 82 Stat. 341, as amended (46 U.S.C. 367); R.S. 4405, as amended (46 U.S.C. 375); sec. 10, 35 Stat. 428 (46 U.S.C. 395); R.S. 4423, as amended (46 U.S.C. 400); R.S. 4429, as amended (46 U.S.C. 407); R.S. 4430, as amended (46 U.S.C. 408); 88 Stat. 423 (46 U.S.C. 411); R.S. 4434, as amended (46 U.S.C. 412); R.S. 4462, as amended (46 U.S.C. 416); sec. 1, 73 Stat. 475 (46 U.S.C. 481); sec. 4, 67 Stat. 462 (43 U.S.C. 1333(d)); sec. 6(b)(1), 80 Stat. 937 (49 U.S.C. 1655(b)(1)); 49 CFR 1.46(b) and (n)(6))

[CGFR 68-82, 33 FR 18808, Dec. 18, 1968, as amended by CGD 73-251, 43 FR 56799, Dec. 4, 1978]

§ 50.05-15 Vessels subject to regulations in this subchapter.

(a) Passenger vessels, tank vessels, cargo and miscellaneous vessels, nuclear vessels, nautical schoolships, mobile offshore drilling units, and oceanographic vessels are subject to the regulations in this subchapter to the extent prescribed by various laws and regulations as described in § 50.01-1. The applicable provisions in this subchapter shall apply to all such U.S. flag vessels, and to all such foreign vessels which carry passengers from any port in the United States except as follows:

(1) Any vessel of a foreign nation signatory to the International Convention for Safety of Life at Sea, 1960, and which has on board a current, valid Convention certificate attesting to the sufficiency of the marine engineering details as prescribed by applicable regulations in this chapter.

(2) Any vessel of a foreign nation having inspection laws approximating those of the United States together with reciprocal inspection arrangements with the United States, and which has on board a current, valid certificate of inspection issued by its government under such arrangements.

(3) Any vessel operating exclusively on inland waters which are not navigable waters of the United States.

(4) Any vessel laid up and dismantled and out of commission.

(5) With the exception of vessels of the U.S. Maritime Administration, any vessel with the title vested in the United States and which is used for public purposes.

(b) Notwithstanding the exceptions previously noted in paragraphs (a) (1) and (2) of this section, foreign vessels of novel design or construction or whose operation involves potential unusual risks shall be subject to inspection to the extent necessary to safeguard life and property in U.S. ports, as further provided by § 2.01-13 in Subchapter A (Procedures Applicable to the Public) of this chapter.

(Sec. 2, 23 Stat. 118, as amended, sec. 1, 63 Stat. 496; 46 U.S.C. 2, 14 U.S.C. 2; Sec. 2, 87 Stat. 418 (46 U.S.C. 86); sec. 3, 82 Stat. 341, as amended (46 U.S.C. 367); R.S. 4405, as amended (46 U.S.C. 375); sec. 10, 35 Stat. 428 (46 U.S.C. 395); R.S. 4423, as amended (46 U.S.C. 400); R.S. 4429, as amended (46 U.S.C. 407); R.S. 4430, as amended (46 U.S.C. 408); 88 Stat. 423 (46 U.S.C. 411); R.S. 4434, as amended (46 U.S.C. 412); R.S. 4462, as amended (46 U.S.C. 416); sec. 1, 73 Stat. 475 (46 U.S.C. 481); sec. 4, 67 Stat. 462 (43 U.S.C. 1333(d)); sec. 6(b)(1), 80 Stat. 937 (49 U.S.C. 1655(b)(1)); 49 CFR 1.46(b) and (n)(6))

[CGFR 68-82, 33 FR 18808, Dec. 18, 1968, as amended by CGD 73-251, 43 FR 56799, Dec. 4, 1978]

§ 50.05-20 Steam-propelled motorboats.

(a) The requirements covering design of the propelling engine, boiler, and the auxiliary machinery, and the inspection thereof on all motor boats which are more than 40 feet in length and which are propelled by machinery driven by steam shall be in accordance with the applicable provisions of this subchapter.

(b) If the engines, boilers, and auxiliary machinery are found to be in safe operating condition at the initial or subsequent periodical inspection, the Officer in Charge, Marine Inspection, shall issue a letter to that effect. Such letter shall be posted on the vessel under glass. The letter will be valid for a specified period of time, as determined by the Officer in Charge, Marine Inspection. The owner, within 30 days prior to its expiration, shall make application to the nearest Officer in Charge, Marine Inspection for a renewal thereof.

(Sec. 1, 54 Stat. 163, as amended; 46 U.S.C. 526)

Subpart 50.10—Definition of Terms Used in This Subchapter

§ 50.10-1 Commandant.

The term "Commandant" means the Commandant U.S. Coast Guard.

§ 50.10-5 Coast Guard District Commander or District Commander.

The term "Coast Guard District Commander" or "District Commander" means an officer of the Coast Guard designated as such by the Commandant to command all Coast Guard activities within his district, which include the inspections, enforcement, and administration of title 52, Revised Statutes, and acts amendatory thereof or supplemental thereto, and rules and regulations thereunder.

§ 50.10-10 Officer in Charge, Marine Inspection (OCMI).

The term "Officer in Charge, Marine Inspection," (OCMI) means any person from the civilian or military branch of the Coast Guard designated as such by the Commandant and who, under the superintendence and direction of the Coast Guard District Commander, is in charge of an inspection zone for the performance of duties with respect to the inspections, enforcement, and administration of title 52, Revised Statutes, and acts amendatory thereof or supplemental thereto, and rules and regulations thereunder.

§ 50.10-15 Marine inspector or inspector.

The term "marine inspector" or "inspector" means any person from the civilian or military branch of the Coast Guard assigned under the superintendence and direction of an Officer in Charge, Marine Inspection, or any other person as may be designated for the performance of duties with respect to the inspections, enforcement and the administration of title 52, Revised Statutes, and acts amendatory thereof or supplemental thereto, and rules and regulations thereunder.

§ 50.10-20 Headquarters.

The term "Headquarters" means the Office of the Commandant, U.S. Coast Guard, Washington, D.C. 20591.

§ 50.10-25 Coast Guard Symbol.

(a) The term "Coast Guard Symbol" means that impression stamped on the nameplates of boilers, pressure vessels, and safety valves by a marine inspector upon the satisfactory completion of the tests and inspection of the product. It may also be used by a marine inspector to identify workmanship test plates and welding samples.

(b) The impression of the Coast Guard Symbol for stamping nameplates and specimens is shown in Figure 50.10-25(b).

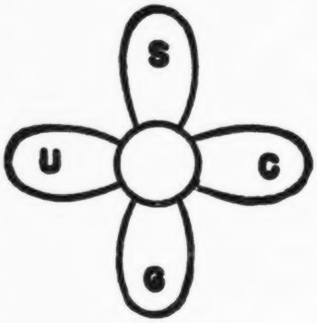


FIGURE 50.10-25(b)—Coast Guard Symbol.

§ 50.10-30 Coast Guard number.

(a) The Coast Guard number means that number assigned to boilers and pressure vessels by the Officer in Charge, Marine Inspection, who makes the final tests and inspections.

(b) The Coast Guard number shall be stamped on the nameplates of boilers and pressure vessels.

(c) The Coast Guard number is comprised of the following:

(1) Three capital letters which identify the office of the issuing Officer in Charge, Marine Inspection (see Table 50.10-30); followed by,

(2) An OCMI serial number, by which the particular boiler or pressure vessel can be identified; the first two digits of which will identify the calendar year the number was assigned.

TABLE 50.10-30—MARINE INSPECTION OFFICE IDENTIFICATION LETTERS IN COAST GUARD NUMBERS FOR BOILERS AND PRESSURE VESSELS

Identification	Marine Inspection Office
ALB	Albany.
ANC	Anchorage.
BAL	Baltimore.
BOS	Boston.
BUF	Buffalo.

TABLE 50.10-30—MARINE INSPECTION OFFICE IDENTIFICATION LETTERS IN COAST GUARD NUMBERS FOR BOILERS AND PRESSURE VESSELS—Continued

Identification	Marine Inspection Office
CHA	Charleston.
CHI	Chicago.
CIN	Cincinnati.
CLE	Cleveland.
COR	Corpus Christi.
DET	Detroit.
DUL	Duluth.
GAL	Galveston.
GUA	Guam.
HON	Honolulu.
HOU	Houston.
HRV	Hampton Roads, Va.
HUN	Huntington.
JAC	Jacksonville.
JUN	Juneau.
LOS	Los Angeles.
LOU	Louisville.
MEM	Memphis.
MIA	Miami.
MIL	Milwaukee.
MIN	Minneapolis.
MOB	Mobile.
NAS	Nashville.
NEW	New Orleans.
NYC	New York.
PAD	Paducah.
PAT	Port Arthur.
PHI	Philadelphia.
PIT	Pittsburgh.
POM	Portland, Maine.
POR	Portland, Oreg.
PRO	Providence.
ROT	Rotterdam.
SAV	Savannah.
SDC	San Diego.
SEA	Seattle.
SFC	San Francisco.
SIM	Saint Ignace.
SJP	San Juan.
SLM	St. Louis.
STB	Sturgeon Bay.
TAM	Tampa.
TOL	Toledo.
VAL	Valdez.
WNC	Wilmington, N.C.

(R.S. 4457, as amended; 46 U.S.C. 414)

[CGFR 68-82, 33 FR 18808, Dec. 18, 1968, as amended by CGFR 69-127, 35 FR 9975, June 17, 1970; CGD 74-219, 39 FR 40158, Nov. 14, 1974; CGD 78-161, 44 FR 13492, Mar. 12, 1979]

Subpart 50.15—Reference Specifications, Standards, and Codes

§ 50.15-1 General acceptance of standard requirements; incorporation by reference.

(a) Industry specifications, standards, and codes, to the extent specified in the text of this chapter are adopted and by reference are incorporated into and shall form a part of the regulations of this chapter. Where references to adopted specifications, standards, and codes are made in plans, contracts, correspondence, etc., or specific provisions of such items, it shall be assumed to include reference to the appropriate adopting regulations in this chapter, unless specifically stated otherwise.

(b) The current issue of the industry specification, standard, or code, including addenda or changes, described in this chapter as adopted by reference, shall be used unless specifically stated otherwise or specifically authorized otherwise by the Commandant. The current issue is that issue, including any addenda or changes, in effect on the date the work is contracted for, or, if no contract exists, the date fabrication is begun. The Commandant may authorize the use of an issue of an earlier or later date when circumstances warrant such action.

(c) Copies of the industry specifications, standards, and codes referred to in this chapter may be obtained from the issuing authority unless specifically indicated otherwise and the source will be indicated. Copies of the industry specifications, standards, and codes, including any addenda and changes, that are adopted by reference may upon request, be examined at Coast Guard Headquarters. An official historic file of the adopted industry specifications, standards, and codes, including any addenda and changes, will be maintained at Coast Guard Headquarters so long as they are in effect and for a period of 10 years thereafter.

(Sec. 552, 80 Stat. 383, as amended; 5 U.S.C. 552)

§ 50.15-5 ASME Boiler and Pressure Vessel Code.

(a) The following sections of the "ASME Boiler and Pressure Vessel Code," published by The American Society of Mechanical Engineers (ASME), United Engineering Center, 345 East 47th Street, New York, NY, 10017, are adopted subject to modifications specified in this subchapter, which appear with the listing:

(1) Section I, Power Boilers (ASME, sec. I).

(2) Section II, Material Specifications (ASME, sec. II).

(3) Section III (Division 1), Nuclear Powerplant Components, Metal Components (ASME, sec. III).

(4) Section IV, Heating Boilers (ASME, sec. IV).

(5) Section V, Nondestructive Examination (ASME, sec. V).

(6) Section VIII (Division 1), Pressure Vessels (ASME, sec. VIII).

(7) Section IX, Welding Qualifications (ASME, sec. IX).

(b) The actions of the ASME Boiler and Pressure Vessel Code not referenced by paragraph (a) of this section are not adopted. Their use is prohibited unless specifically allowed by the Commandant.

(c) Fabricators constructing boilers, pressure vessels, and safety valves for installation on vessels subject to the regulations in this subchapter need not possess the various ASME Code Symbol stamps. However, an exemption from the regular Coast Guard procedure for plan approval, shop inspection, and stamping is granted for certain heating boilers and pressure vessels which bear an ASME stamp as provided for in §§ 53.10-5, 53.15-5, and 54.01-15(a) of this subchapter.

(d) Fabricators constructing nuclear powerplant components, parts, piping subassemblies, and appurtenances for installation on vessels subject to the regulations in this subchapter shall possess an appropriate Code N-symbol stamp as described in paragraph NA-8230 of section III of the ASME Code. The building facility of the vessel on which the nuclear powerplant is to be installed need not possess the installer's stamp (NA-8233.7), or N-type symbol stamps for work related to the construction of a containment vessel (Class MC) and piping subassemblies of any class (see NA-2120) that are actually constructed by the building facility for the vessel's nuclear powerplant as provided for in § 55.05-1 (b) and (c) of this subchapter.

(Sec. 552, 80 Stat. 383, as amended; 5 U.S.C. 552)

[CGFR 68-82, 33 FR 18808, Dec. 18, 1968, as amended by CGFR 69-127, 35 FR 9975, June 17, 1970; CGD 72-206R, 38 FR 17226, June 29, 1973]

§ 50.15-10 ANSI Standards.

(a) All "ANSI Standards" of the American National Standards Institute (ANSI), 1430 Broadway, New York, N.Y. 10018, specifically described in this subchapter are adopted subject to the limitations and modifications specified in this subchapter which appear with the listing. Many of these standards are published by and may be obtained from The American Society of Mechanical Engineers, United Engineering Center, 345 East 47th Street, New York, N.Y. 10017. When a standard is not published by this Society, the publisher will be indicated in the specific listing.

(b) The actions of the ANSI Codes not listed in this subchapter, are not adopted. Their use is prohibited unless specifically allowed by the Commandant.

[CGFR 69-127, 35 FR 9975, June 17, 1970]

§ 50.15-13 Code Cases—ASME and ANSI.

(a) Code cases for ASME Sections and for ANSI Standards are not adopted.

(b) When the use of a current ASME or ANSI code case is desired with regard to a specific installation, permission for such use must be obtained from the Commandant.

[CGFR 69-127, 35 FR 9975, June 17, 1970]

§ 50.15-15 ASTM Specifications.

(a) All ASTM specifications of the American Society for Testing and Materials (ASTM), 1916 Race Street, Philadelphia, Pa. 19103, specifically described in an adopted code, standard or specification or in this subchapter are adopted subject to the limitations and modifications specified in such code, standard or specification or in this subchapter, which appear with the listing.

(b) The ASTM Specifications not listed in an adopted code, standard or specification or in this subchapter are not adopted. Their use is prohibited unless specifically allowed by the Commandant.

(c) Where an ASTM Specification is not adopted verbatim by the American Society of Mechanical Engineers (ASME) in section II of the ASME Boiler and Pressure Vessel Code, Material Specifications, the ASME applicable requirements shall be governing.

(Sec. 552, 80 Stat. 383, as amended; 5 U.S.C. 552)

§ 50.15-20 Additional standards.

(a) In addition to the previously referenced ASME, ANSI, and ASTM Standards, the following organizations have specifically selected standards described in this subchapter which are adopted subject to the limitations and modifications specified in this subchapter which appear with the listing:

(1) American Boat and Yacht Council, Inc. (ABYC), 15 East 26th Street, Room 1603, New York, N.Y. 10010.

(2) American Welding Society (AWS), United Engineering Center, 345 East 47th Street, New York, N.Y. 10017.

(3) Commercial Standards, Commerce Department, National Bureau of Standards, Washington, D.C. 20234.

(4) Compressed Gas Association (CGA), 500 Fifth Avenue, New York, N.Y. 10036.

(5) Manufacturer's Standardization Society of the Valve and Fittings Industry (MSS), 1815 North Fort Myer Drive, Arlington, Va. 22209.

(6) Military specifications, which may be obtained from the Commanding Officer, Naval Supply Depot, 5801 Tabor Avenue, Philadelphia, Pa. 19120.

(7) National Fire Protection Association (NFPA), 60 Batterymarch Street, Boston, Mass. 02110.

(8) National Fluid Power Association (NFPA), Post Office Box 49, Thiensville, Wis. 53092.

(9) Tubular Exchanger Manufacturer's Association (TEMA), 331 Madison Avenue, New York, N.Y. 10017.

(10) Underwriters' Laboratories, Inc. (UL), 207 East Ohio Street, Chicago, Ill. 60611.

(11) Underwriters' Laboratories, Inc., Marine Department, Tampa East Industrial Park, 2602 Tampa East Blvd., Tampa, Florida 33619.

(12) Fluid Controls Institute, Inc., Post Office Box 1485, Pompano Beach, FL 33061.

(13) American Petroleum Institute (API), 1201 L Street, Washington, D.C. 20037.

(b) All standards of the organizations referenced in paragraph (a) of this section and not listed or referenced to in this subchapter are not adopted. Their use is prohibited unless specifically allowed by the Commandant.

(Sec. 552, 80 Stat. 383, as amended; 5 U.S.C. 552; Sec. 2, 87 Stat. 418 (46 U.S.C. 86); sec. 3, 82 Stat. 341, as amended (46 U.S.C. 367); R.S. 4405, as amended (46 U.S.C. 375); sec. 10, 35 Stat. 428 (46 U.S.C. 395); R.S. 4423, as amended (46 U.S.C. 400); R.S. 4429, as amended (46 U.S.C. 407); R.S. 4430, as amended (46 U.S.C. 408); 88 Stat. 423 (46 U.S.C. 411); R.S. 4434, as amended (46 U.S.C. 412); R.S. 4462, as amended (46 U.S.C. 416); sec. 1, 73 Stat. 475 (46 U.S.C. 481); sec. 4, 67 Stat. 462 (43 U.S.C. 1333(d)); sec. 6(b)(1), 80 Stat. 937 (49 U.S.C. 1655(b)(1)); 49 CFR 1.46(b) and (n)(6))

[CGFR 68-82, 33 FR 18808, Dec. 18, 1968, as amended by CGFR 69-127, 35 FR 9975, June 17, 1970; CGFR 72-59R, 37 FR 6188, Mar. 25, 1972; CGD 73-248, 39 FR 30838, Aug. 26, 1974; 43 FR 56799, Dec. 4, 1978]

§ 50.15-30 Changes, interpretations and exceptions to specifications, standards, and codes.

(a) When changes are made to any of the specifications, standards or codes referenced in §§ 50.15-5 through 50.15-20 or listed elsewhere in this subchapter, the effective date for their use as a part of the regulations in this subchapter is the effective date set by the issuing authority of the applicable standard or code.

(b) Regulations in this subchapter containing material reproduced from any of the specifications, standards or codes adopted by §§ 50.15-5 through 50.15-20, or elsewhere in this subchapter will be changed by amendments in the FEDERAL REGISTER without prior notice of proposed rule making. The effective date of such amendments will be the same as that set by the issuing authority of the applicable specification, standard or code.

(c) If any person or organization desires changes, interpretations, or exceptions to requirements in any specifications, standards or codes, including "Code Cases," referenced in regulations in this subchapter, such person or organization should first present such request to the issuing organization and obtain a ruling thereon. The Coast Guard's policy with respect to changes, interpretations or exceptions to any specification, standard, or code, including a "Code Case," is to have them presented to the issuing organization for resolution; however, the right to provide specific exceptions or to restrict or to limit the use of a specification, standard or code, including a "Code Case," is expressly reserved. Such exception or restrictive action, if it has general applicability, will be published as a rule or regulation in this subchapter under rule making procedures governing emergency situations.

§ 50.15–60 Procedures followed when Coast Guard takes exception to referenced published requirements.

(a) The normal manufacturing practices are based on the use of certain industrial specifications, standards, and codes, including "Code Cases," which are referenced in the text in this subchapter. However, it is realized that certain provisions of such requirements are based on conditions normally found "ashore," rather than what may be experienced on board vessels.

(b) When the Coast Guard determines that a specification, standard, code or "Code Case" referenced in this subchapter permits material or equipment that is unsatisfactory for marine use, a restriction or prohibition will be published in the FEDERAL REGISTER as a rule or regulation under rule making procedures governing emergency situations. The basis or reason underlying this determination will be included along with the published rule or regulation. The matter will be announced for further consideration at a Merchant Marine Council Public Hearing as described in 33 CFR 1.05–15. All affected parties may present comments, suggestions or recommendations.

(c) If a person or organization feels aggrieved by the Coast Guard's action prior to the Public Hearing or date set for the submittal in an individual case involving the restriction or prohibition of the referenced requirement, such person or organization may appeal the actions of the Officer in Charge, Marine Inspection, which are based on this published prohibition. This appeal shall be in accordance with § 50.20–40.

Subpart 50.20—Plan Submittal and Approval

§ 50.20–1 General.

(a) The required vessel, equipment, or installation plans, as listed in this subchapter, are general in character, but include all plans which normally show the intended construction and safety features coming under the cognizance of the Coast Guard. In a particular case, however, not all of the plans enumerated may be applicable, and in such cases the Coast Guard will so notify the submitter.

(b) Manufacturers of boilers, pressure vessels and other components, which require specific fabrication inspection in accordance with the requirements of this subchapter, shall submit and obtain approval of the applicable construction plans prior to the commencement of such fabrication.

§ 50.20–5 Procedures for submittal of plans.

(a) As the relative locations of shipyards, design offices, and Coast Guard offices vary throughout the country, no specific routing will be required in the submittal of plans. In general, one of the procedures outlined in this section apply, but if a more expeditious procedure can be used, there will normally be no objection to it.

(b) The plans may be submitted to the Officer in Charge, Marine Inspection, at or nearest the place where the vessel is to be built. This procedure will be most expeditious in those cases where local offices have personnel and facilities available for examination and approval of the plans.

(c) The plans may be submitted directly to the Commandant (MMT), U.S. Coast Guard, 1300 E Street NW., Washington, D.C. 20591. In this case, the plans will be reviewed and returned directly to the submitter, with a copy of the action being forwarded to the interested Officer in Charge, Marine Inspection.

(1) Plans for boilers and nuclear vessels should be submitted in this manner.

(d) Plans, except those for boilers and nuclear vessels, may be submitted directly to the field technical office having jurisdiction over the geographic location where the ship or pressure component is manufactured:

(1) Commander, 3d Coast Guard District (mmt), Governors Island, New York, N.Y. 10004, for the geographical area covered by the 1st and 3d Coast Guard Districts.

(2) Commander, 8th Coast Guard District (mmt), Hale Boggs Federal Building, 500 Camp Street, New Orleans, La. 70130, for the geographical area covered by the 2d, 7th, and 8th Coast Guard Districts.

(3) Commander, 12th Coast Guard District (mmt), 630 Sansome Street, San Francisco, Calif. 94126, for geographical area covered by 11th, 12th, 13th, 14th, and 17th Coast Guard Districts.

(4) Commander, 9th Coast Guard District (mmt), Room 2019, 1240 East Ninth Street, Cleveland, Ohio 44199, for geographical area covered by the 9th Coast Guard District.

(5) Commander, 5th Coast Guard District (mmt), Federal Building, 431 Crawford Street, Portsmouth, Va. 23705, for the geographical area covered by the 5th Coast Guard District.

(e) In the case of classed vessels, upon specific request by the submitter, the American Bureau of Shipping will arrange to forward the necessary plans to the Coast Guard indicating its action thereon. In this case, the plans will be returned directly to the submitter as noted in paragraph (c) of this section.

(5 U.S.C. 552, 14 U.S.C. 633)

[CGFR 68-82, 33 FR 18808, Dec. 18, 1968, as amended by CG 78-108, 43 FR 46545, Oct. 10, 1978]

§ 50.20–10 Number of copies of plans required.

(a) Three copies of each plan are normally required so that one copy can be returned to the submitter. If the submitter desires additional copies of approved plans, a suitable number should be submitted to permit the required distribution.

§ 50.20–15 Previously approved plans.

(a) A manufacturer wishing to fabricate equipment in accordance with a plan previously approved (including work accomplished under a different contract) shall not be required to resubmit such plans provided:

(1) Certification is submitted that the proposed equipment conforms in every respect to the plan previously approved, and such certification contains the drawing number, title, date, and last revision or change date, and date of previous approval;

(2) The current regulations, including adopted specifications, standards or codes, pertaining to the proposed equipment are the same as those current when the original plan was approved; and

(3) The original plan approval was given by the same office from which the new approval is desired.

§ 50.20–25 Calculations.

(a) Calculations shall be forwarded with plans submitted for approval and shall clearly substantiate compliance with the regulations in this subchapter. Care shall be taken to identify sources of equations, factors and other information upon which the calculations are based.

(b) The results of the calculations, such as the maximum allowable working pressure (MAWP), test pressure, and safety device settings, shall be clearly identified.

§ 50.20–30 Alternative materials or methods of construction.

(a) When new or alternative procedures, designs, or methods of construction are submitted for approval and for which no regulations have been provided, the Commandant will act regarding the approval or disapproval thereof.

(b) If, in the development of industrial arts, improved materials or methods of construction are developed, their use in lieu of those specified will be given consideration upon formal application to the Commandant, with full information as to their characteristics, together with such scientific data and evidence as may be necessary to establish the suitability of such materials or methods of construction for the purpose intended.

§ 50.20–33 Correspondence regarding approved plans.

(a) The Coast Guard maintains records concerning plans, calculations, etc., of equipment approved in accordance with the regulations in this subchapter for 5 years. After 5 years from the date of original approval of a drawing, plan or calculation and related correspondence, any submittal or correspondence which refers to such documents shall be accompanied by copies of the documents, including pertinent correspondence.

§ 50.20–35 Marine inspector's decisions.

(a) When it becomes necessary for a marine inspector to make decisions on matters covered by the regulations in this subchapter or by requirements in referenced specifications, standards or codes, the inspector shall inform the owner or his representative of the requirement, which will be identified by source, section and paragraph number, on which the decisions are based. Whenever it is necessary to make decisions in matters not specifically covered by the regulations in this subchapter or by referenced requirements, the marine inspector shall clearly state the reasons which caused him to arrive at such decisions.

(b) If the owner or his representative disagrees with a decision made by the marine inspector, he shall take up the matter with the local Officer in Charge, Marine Inspection. The owner or his representative may appeal the decision of the Officer in Charge, Marine Inspection, in accordance with § 50.20–40.

§ 50.20–40 Appeals.

(a) In the event that a design, decision, or other matter, submitted in accordance with the requirements of this subchapter, is disapproved by the Officer in Charge, Marine Inspection, the person if aggrieved, may appeal, within 30 days, to the Coast Guard District Commander of the district. Should the Coast Guard District Commander sustain the Officer in Charge, Marine Inspection, such a person may, within 30 days, further appeal to the Commandant.

(b) Pending the determination of the appeal, the decision of the Officer in Charge, Marine Inspection, shall remain in effect. The decision of the Commandant shall be final.

Subpart 50.25—Certification of Material by Mill or Manufacturer

§ 50.25–1 General.

(a) Certain products used in the construction of boilers, pressure vessels, pressure piping systems, and related components shall be certified by the manufacturer or the mill where produced by the method outlined in Table 50.25(a). The piping component definitions are in § 56.07–5 of this subchapter.

TABLE 50.25–1(a)—CERTIFICATION REQUIREMENTS FOR CERTAIN PRODUCTS

Identification No.	Product	Verification	Listing in CG-190 [1]
1	Plate, staybolt and rivet steel, bar stock, etc.	Manufacturer's or mill's certificate	No.
2	Piping and tubing	do	No.
3	Standard pipe joining fittings (elbow, tee, reducer, etc.).	do	No.
4	Bolting	do	No.
5	Castings	do	No.
6	Forgings	do	No.
7	Valves (nonwelded construction)	Affidavit	Yes.[2]
8	Flanges	do	Yes.[3]
9	Nonstandard fluid conditioner fittings [4] (traps, drains, strainers, etc.).	do	Yes.[3 5]

TABLE 50.25-1(a)—CERTIFICATION REQUIREMENTS FOR CERTAIN PRODUCTS—Continued

Identification No.	Product	Verification	Listing in CG-190 [1]
10	Nonstandard special purpose fittings [4] (expansion joints, flexible couplings, etc.):.		
	a. For maximum allowable pressure not exceeding 15 pounds per square inch.	do	Yes.[2]
	b. For maximum allowable pressure above 15 pounds per square inch.	Specific letter and approved plan	No.[6]
11	Valves and nonstandard fittings (welded construction).	do	No.[6]
12	Nonstandard pipe joining fittings [4]	do	No.[5]
13	Nonmetallic flexible hose	Affidavit	Yes.
14	Valves and fittings designed for hydraulic service, as described in § 58.30-15(f), that require testing as per § 58.30-17.	Specific letter	Yes.

[1] The Coast Guard publishes periodically a pamphlet, CG-190, Equipment Lists, which includes lists of names of manufacturers of certain types of required equipment. The current actions with respect to affidavits are also published in the Coast Guard's Proceedings of the Merchant Marine Council.

[2] It is anticipated that when acceptable industry design and marking standards are adopted such listings will be terminated.

[3] It is anticipated that when revised industry marking standards are adopted such listings will be terminated.

[4] See § 56.07-5 of this subchapter for definitions of the various types of fittings.

[5] See § 56.15-1(e) of this subchapter for exemptions.

[6] Manufacturers shall be consulted for information on specific items for which approval is granted.

[CGFR 68-82, 33 FR 18808, Dec. 18, 1968, as amended by CGFR 72-59R, 37 FR 6188, Mar. 25, 1972]

§ 50.25-3 Manufacturer or mill certification.

(a) A manufacturer or mill producing materials used in certain products for installation on inspected vessels, shall issue a certificate or mill test report which shall report the results of chemical analysis and physical tests required by the ASTM specification.

(b) This certificate shall be made available to the marine inspector and Officer in Charge, Marine Inspection, upon request to the fabricator. (For exception refer to § 50.25-5(d).)

§ 50.25-5 Products requiring manufacturer or mill certification.

(a) Products required to be certified by a manufacturer or by mill certificate as listed in Table 50.25-1(a), shall be fabricated and tested in accordance with the applicable specifications. Such products will not normally be subject to mill inspection by the Coast Guard except as required by § 50.25-7.

(b) The Officer in Charge, Marine Inspection, having cognizance over the installation of the products required to be certified shall ensure that adequate control has been exercised to identify the product with its manufacturer or mill certificate.

(c) In the event that the Officer in Charge, Marine Inspection, determines that handling of a product has been such that proper identification is not possible, he may:

(1) Require testing in his presence based on the applicable material or fabrication specification; or

(2) Reject the product on the basis that it cannot be properly identified.

(d) A product conforming to an acceptable material specification may, at the discretion of the Officer in Charge, Marine Inspection, be accepted without referring to its manufacturer or mill certification, if:

(1) The product is marked in accordance with the identification marking requirements of the specification;

(2) The marking alone is sufficient to identify that specification; and

(3) In the opinion of the Officer in Charge, Marine Inspection, the application of the product does not require knowledge of the exact chemical analyses or physical properties enumerated on the manufacturer or mill certificate.

§ 50.25-7 Testing of products required to be certified in presence of marine inspector.

(a) Certified products (refer to Table 50.25-1(a)) are not normally tested in the presence of a marine inspector. The Commandant may, however, assign a marine inspector to witness tests required by the applicable specifications to satisfy himself that the requirements are met.

(b) Marine inspectors shall have free entry at all times to those parts of the plant where material subject to the regulations in this subchapter is being manufactured. The manufacturer shall provide marine inspectors all reasonable facilities to satisfy them that the material is being manufactured in accordance with the requirements of the Commandant.

(c) Unless otherwise authorized, required tests and inspections described in applicable specifications shall be made at the place of manufacture prior to shipment. Unless otherwise specified, tests shall be performed at room temperature. These tests when performed in the presence of a marine inspector will be so conducted as not to interfere unnecessarily with the operation of the plant.

(d) Marine inspectors shall assure themselves that test specimens are marked for positive identification with the materials which they represent.

§ 50.25-10 Affidavit, Form CG-935A, and acceptance of products described therein.

(a) The intent of the affidavit, Form CG-935A, is to rely upon the integrity of the manufacturer in assuring compliance with applicable requirements. The use of affidavits will terminate when appropriate standards are available.

(b) A manufacturer who receives acceptance under this system has certified that his products, which are coverable under this system (see Table 50.25-1(a)), will conform to the applicable requirements when provided for use aboard inspected vessels.

(c) Acceptance of a manufacturer's affidavit is based upon his satisfying the Coast Guard that he understands the applicable requirements and that he can and will comply with them. To obtain acceptance the manufacturer shall do the following:

(1) Submit to Commandant (MMT), a duly executed affidavit, Form CG-935A, for one or more of the general product categories for which acceptance is desired. An affidavit shall be signed by an official of the company authorized to make an affidavit in the name of the company. That official shall be sufficiently informed of the company's products and their fabrication to assure compliance with regulations of this subchapter.

(2) Submit an engineering type catalogue which depicts the products covered by the affidavit. If a catalogue is not available, representative drawings of the products shall be submitted.

(3) Identify materials by ASTM specifications which shall meet the requirements of Subpart 56.60 of this subchapter. Where this is not possible, submit complete chemical and physical test data, and testing results. Identify the industry standards, if any, to which the products are manufactured.

(4) Submit a description of nondestructive testing performed on the products.

(5) Submit a description of the marking applied to the products.

(6) Submit information showing compliance with the requirements of Subparts 56.15, 56.20, 56.25, 56.30, or 56.35 of this subchapter as applicable.

(7) Submit such additional information as the Commandant may deem consistent with the special design or application of the product.

(d) When these requirements have been met and if the product is found to be in accordance with the regulations of this subchapter, the manufacturer may be accepted as a supplier of the product for use aboard vessels inspected by the Coast Guard.

(e) The manufacturer's affidavit will be kept on file and his name will be listed in the affidavit section of subsequent editions of CG-190 "Equipment Lists."

§ 50.25-15 Products of unusual design or limited application.

(a) Manufacturers of products which are of unusual design or of only occasional or limited application aboard ship, may obtain individual acceptance of their products for use in specific installations. The manufacturer shall submit the information described in § 50.25-10(c) (2) through (7).

(b) Since affidavits for products of unusual design or limited application are not necessary for individual installation, manufacturers of these products are not listed in CG-190, "Equipment Lists."

§ 50.25-20 Welded valves and nonstandard welded fittings.

(a) Manufacturers of valves and nonstandard fittings fabricated by welding may obtain individual acceptance of their products for use in specific installations. The manufacturer shall submit the information described in § 50.25-10(c) (2) through (7) and § 56.15-1 of this subchapter. In addition, the applicable requirements of Part 57 of this subchapter shall be satisfied.

(b) Since affidavits for such welded valves and fittings are not necessary for individual installations, manufacturers of welded valves and nonstandard welded fittings are not listed in CG-190, "Equipment Lists."

§ 50.25-25 Nonstandard pipe joining fittings.

(a) Manufacturers of nonstandard pipe joining fittings may obtain individual acceptance of their products for use in specific installations. The manufacturer shall submit the information described in § 50.25-10(c) (2) through (7).

(b) Since affidavits for nonstandard pipe joining fittings are not necessary for individual installations, manufacturers of these products are not listed in CG-190, "Equipment Lists."

§ 50.25-30 Special purpose fittings for service above 15 pounds per square inch pressure.

(a) Manufacturers of nonstandard special purpose fittings for maximum allowable pressures above 15 pounds per square inch gage may obtain individual acceptance of their products for use in specific installations. The manufacturers shall submit the information described in § 50.25-10(c) (2) through (7), § 56.30-35, and § 56.35-15 of this subchapter as applicable.

(b) Since affidavits for special purpose fittings are not necessary in individual installations, manufacturers of these products are not listed in CG-190, "Equipment Lists."

[CGFR 68-82, 33 FR 18808, Dec. 18, 1968, as amended by CGD 73-254, 40 FR 40163, Sept. 2, 1975]

§ 50.25-35 Fluid conditioner fitting.

Nonstandard fluid conditioner fittings which due to their size, service, or operating condition, as specified in § 56.15-1(e) (1) and (f) of this chapter are subject to the requirements of Part 54 of this chapter (except for stamping and shop inspection), shall not be acceptable to the Coast Guard as affidavit products as allowed in this subpart, or listed in CG-190, "Equipment Lists." Other nonwelded fluid conditioner fittings are listed in CG-190.

[CGD 73-248, 39 FR 30838, Aug. 26, 1974]

§ 50.25-40 Foreign manufacturers.

(a) Foreign manufacturers of material which requires certification but not an affidavit submission may follow the same procedure as outlined in § 50.25-5. Prior to its installation, however, the Officer in Charge, Marine Inspection, may require the product to be tested in his presence to the applicable material specification, or any portion thereof, regardless of whether or not the product is accompanied by a manufacturer's or mill certificate.

(b) Foreign manufacturers of affidavit products may obtain singular acceptance of their materials and products for use in specific installations: Provided, That through the use of mill certificates or the equivalent they satisfactorily demonstrate compliance with the applicable regulations of this subchapter. Sufficient information shall be submitted to satisfy the intent of § 50.25-10(c) (2) through (7). Affidavits, Form CG-935A, shall not be accepted from foreign manufacturers. Foreign manufacturers will not be listed in CG-190, "Equipment Lists."

Subpart 50.30—Fabrication Inspection

§ 50.30–1 Scope.

(a) It shall be the responsibility of the manufacturer to notify the Officer in Charge, Marine Inspection, of the intended fabrication of boilers or pressure vessels that will require Coast Guard inspection.

(b) For exemption of certain pressure vessels from shop inspection see § 54.01–15 of this subchapter.

(c) For a classification delineation of boilers and pressure vessels refer to Tables 54.01–5(a) and 54.01–5(b) of this subchapter.

§ 50.30–5 Boilers.

(a) The manufacturer shall submit boilers as defined under Parts 52 and 53 of this subchapter for shop inspection at such stages of fabrication as may be requested by the Officer in Charge, Marine Inspection.

§ 50.30–10 Class I, I–L, II–L, or nuclear pressure vessels.

(a) Classes I, I–L, II–L, and nuclear pressure vessels shall be subject to shop inspection at the plant where they are being fabricated, as or when determined necessary by the Officer in Charge, Marine Inspection.

(b) The manufacturer shall submit Class I, I–L, II–L, and nuclear pressure vessels, as defined in Parts 54 and 55 of this subchapter for shop inspection at such stages of fabrication as may be requested by the Officer in Charge, Marine Inspection.

§ 50.30–15 Class II pressure vessels.

(a) Class II pressure vessels shall be subject to shop inspections at the plant where they are being fabricated, as or when determined necessary by the Officer in Charge, Marine Inspection. The inspections described in this section are required, unless specifically exempted by other regulations in this subchapter.

(b) The first inspection of Class II welded pressure vessels shall be performed during the welding of the longitudinal joint. At this time the marine inspector shall check the material and fit-up of the work, and ascertain that only welders who have passed the required tests are employed.

(c) A second inspection of Class II welded pressure vessels shall be made during the welding of the circumferential joints. At this time the marine inspector shall check any new material being used which may not have been examined at the time of the first inspection, also the fit-up of the vessel at this stage of fabrication, and in addition, observe the welding and ascertain that only welders who have passed the required tests are employed.

§ 50.30–20 Class III pressure vessels.

(a) Class III pressure vessels shall be subject to shop inspection at the plant where they are being fabricated, as or when determined necessary by the Officer in Charge, Marine Inspection. The inspection described in this section is required, unless specifically exempted by other regulations in this subchapter.

(b) For Class III welded pressure vessels, one inspection shall be made during the welding of the longitudinal joint. If there is no longitudinal joint, the inspection shall be made during the welding of a circumferential joint. At this time the marine inspector shall check the material and fit-up of the work and see that only welders who have passed the required tests are employed.

PART 51—[RESERVED]

PART 52—POWER BOILERS

Subpart 52.01—General Requirements

Sec.

52.01–1 Adoption of section I of the ASME Code.
52.01–3 Definitions of terms used in this part.
52.01–5 Plans.
52.01–10 Automatic controls.
52.01–35 Auxiliary, donkey, fired thermal fluid heater, and heating boilers.
52.01–40 Materials and workmanship.
52.01–50 Fusible plugs (replaces A–19 through A–21).
52.01–55 Increase in maximum allowable working pressure.
52.01–90 Materials (modifies PG–5 through PG–13).

Sec.
52.01-95 Design (modifies PG-16 through PG-31 and PG-100).
52.01-100 Openings and compensation (modifies PG-32 through PG-39, PG-43 through PG-55, replaces PG-42).
52.01-105 Piping, valves and fittings (replaces PG-58 and PG-59).
52.01-110 Water level indicators, water columns, gage glass connections, gage cocks, and pressure gages (modifies PG-60).
52.01-115 Feedwater supply (replaces PG-61).
52.01-120 Safety valves and safety relief valves (modifies PG-67 through PG-72).
52.01-125 Fabrication (modifies PG-75 through PG-82).
52.01-130 Installation.
52.01-135 Inspection and tests (modifies PG-90 through PG-100).
52.01-140 Certification by stamping (modifies PG-105 through PG-113).
52.01-145 Manufacturers' data report forms (modifies PG-112 and PG-113).

Subpart 52.05—Requirements for Boilers Fabricated by Welding

52.05-1 General (modifies PW-1 through PW-54).
52.05-5 Scope and responsibility (modifies PW-1).
52.05-10 Design (modifies PW-8 through PW-19).
52.05-15 Heat treatment (modifies PW-10).
52.05-20 Radiographic and ultrasonic examination (modifies PW-11 and PW-41.1).
52.05-30 Minimum requirements for attachment welds (modifies PW-16).
52.05-35 Welded-in staybolts (modifies PW-19).
52.05-40 Welded fabrication (modifies PW-26 through PW-43).
52.05-45 Circumferential joints in pipes, tubes and headers (modifies PW-41).
52.05-50 Joints in boiler appurtenances (replaces PW-42).
52.05-55 Inspection and tests of welded boilers (modifies PW-46 through PW-54).

Subpart 52.10—Requirements for Boilers Fabricated by Riveting

52.10-1 General (modifies PR-1 through PR-50).
52.10-3 Thickness of buttstraps (modifies PR-14).
52.10-5 Longitudinal riveted joints (replaces PR-16).
52.10-10 Circumferential joints (modifies PR-17).
52.10-15 Riveted fabrication (modifies PR-30 through PR-40).

Sec.

Subpart 52.15—Requirements for Watertube Boilers

52.15-1 General (modifies PWT-1 through PWT-15).
52.15-5 Tube connections (modifies PWT-9 and PWT-11).

Subpart 52.20—Requirements for Firetube Boilers

52.20-1 General (modifies PFT-1 through PFT-49).
52.20-5 Shell joints (modifies PFT-10).
52.20-10 Combustion chambers and furnaces (modifies PFT-13 through PFT-21).
52.20-15 Stayed surfaces (modifies PFT-22 through PFT-38).
52.20-17 Opening between boiler and safety valve (modifies PFT-44).
52.20-20 Domes (modifies PFT-45).
52.20-25 Setting (modifies PFT-46).

Subpart 52.25—Other Boiler Types

52.25-1 General.
52.25-5 Miniature boilers (replaces PMB-1 through PMB-21).
52.25-10 Organic fluid vaporizer generators (modifies PVG-1 through PVG-12).

AUTHORITY: R.S. 4405, as amended, 4462, as amended, sec. 633, 63 Stat. 545, sec. 6(b)(1), 80 Stat. 938; 46 U.S.C. 375, 416, 14 U.S.C. 633, 49 U.S.C. 1655(b); 49 CFR 1.4(a)(2), (f). R.S. 4417, as amended, 4417a, as amended, 4418, as amended, 4426–4431, as amended, 4433, as amended, 4434, as amended, 4491, as amended, sec. 14, 29 Stat. 690, as amended, sec. 10, 35 Stat. 428, as amended, 41 Stat. 305, as amended, secs. 1, 2, 49 Stat. 1544, 1545, as amended, sec. 17, 54 Stat. 166, as amended, sec. 3, 54 Stat. 347, as amended, sec. 3, 70 Stat. 152, sec. 3, 68 Stat. 675; 46 U.S.C. 391, 391a, 392, 404–409, 411, 412, 489, 366, 395, 363, 367, 526p, 1333, 390b, 50 U.S.C. 198; E.O. 11239, July 31, 1965, 30 FR 9671, 3 CFR 1965 Supp., unless otherwise noted.

SOURCE: CGFR 68–82, 33 FR 18815, Dec. 18, 1968, unless otherwise noted.

Subpart 52.01—General Requirements

NOTE: See § 50.15–5 for general adoption of the ASME (American Society of Mechanical Engineers) Code. The adoption of section I of the ASME Code, for power boilers is subject to specific limitations or modifications as described in this part. Those requirements in section I of the ASME Code which are not referred to in this part are adopted without change. Table 52.01-1(a) sets forth a general reference to various paragraphs in section I of the ASME Code which are limited, modified, or replaced by regulations in this part.

§ 52.01-1 Adoption of section I of the ASME Code.

(a) Main power boilers and auxiliary boilers shall be designed, constructed, and tested in accordance with section I of the ASME (American Society of Mechanical Engineers) Code, as limited, modified, or replaced by specific requirements in this part. The provisions in the appendix to section I of the ASME Code are adopted and shall be followed when the requirements in section I make them mandatory. For general information Table 52.01-1(a) lists the various paragraphs in section I of the ASME Code which are limited, modified, or replaced by regulations in this part.

TABLE 52.01-1(a)—LIMITATIONS AND MODIFICATIONS IN THE ADOPTION OF SECTION I OF THE ASME CODE

Paragraphs in section I, ASME Code[1] and disposition	Unit of this part
PG-1 replaced by	54.01-5(a)
PG-5 through PG-13 modified by	52.01-90
PG-16 through PG-31 modified by.	52.01-95
PG-32 through PG-55 modified by.	52.01-100(f)
PG-42 replaced by	52.01-100(f)
PG-58 and PG-59 replaced by	52.01-105
PG-60 modified by	52.01-110
PG-61 replaced by	52.01-115 (56.50-30)
PG-67 through PG-72 modified by.	52.01-120
PG-75 through PG-82 modified by.	52.01-125
PG-90 through PG-100 modified by.	52.01-135 (52.01-95(e))
PG-91 modified by	52.01-135(b)
PG-99 modified by	52.01-135(c)
PG-100 modified by	52.01-95(e)
PG-104 through PG-106 modified by.	52.01-140(a)
PG-107 through PG-109 replaced by.	52.01-140(e)
PG-110 modified by	52.01-140(f)
PG-111 through PG-113 modified by.	52.01-140(a)
PG-112 and PG-113 modified by	52.01-145
PW-1 through PW-54 modified by	52.05-1
PW-1 modified by	52.05-5
PW-8 modified by	52.05-10
PW-10 modified by	52.05-15
PW-11.1 modified by	52.05-20
PW-16 modified by	52.05-30
PW-19 modified by	52.05-35
PW-26 through PW-43 modified by.	52.05-40
PW-41 modified by	52.05-20, 52.05-45
PW-42 replaced by	52.05-50
PW-46 through PW-54 modified by.	52.05-55
PR-1 through PR-50 modified by	52.10-1
PR-14 modified by	52.10-3
PR-16 replaced by	52.10-5
PR-17 modified by	52.10-10
PR-30 through PR-40 modified by.	52.10-15
PWT-1 through PWT-15 modified by.	52.15-1
PWT-9 modified by	52.15-5
PWT-9.2 replaced by	52.15-5(b)
PWT-11 modified by	52.15-5
PWT-11.3 replaced by	52.15-5(b)
PFT-1 through PFT-49 modified by.	52.20-1
PFT-10 modified by	52.20-5
PFT-13 through PFT-21 modified by.	52.20-10
PFT-22 through PFT-38 modified by.	52.20-15
PFT-45 modified by	52.20-20
PFT-46 modified by	52.20-25
PMB-1 through PMB-21 replaced by.	52.25-5
PVG-1 through PVG-12 modified by.	52.25-10
A-19 through A-21 replaced by	52.01-50

[1] The references to specific provisions in the ASME Code are coded. The first letter "P" refers to section I, while the letter "A" refers to the appendix to section I. The letter or letters following "P" refer to a specific subsection of section I. The number following the letter or letters refers to the paragraph so numbered in the text.

(1) As stated in § 50.15-5 of this subchapter, section I of the ASME Code is adopted and shall be the governing requirements for main power boilers and auxiliary boilers unless specifically limited, modified or replaced by other regulations in this part.

(b) References to the ASME Code, such as paragraph PG-1, indicate:

P=Section I, Power Boilers ASME Code.
G=Subsection—General.
1=Paragraph 1.

(c) When a section or paragraph of the regulations in this part relates to material in section I of the ASME Code, the relationship with the code will be shown immediately following the heading of the section or at the beginning of the paragraph as follows:

(1) (Modifies P ——.) This indicates that the material in P —— is gener-

ally applicable but is being altered, amplified or augmented.

(2) (Replaces P ——.) This indicates that P —— does not apply.

(3) (Reproduces P ——.) This indicates that P —— is being identically reproduced for convenience, not for emphasis.

(Sec. 552, 80 Stat. 383, as amended; 5 U.S.C. 552)

[CGFR 68-82, 33 FR 18815, Dec. 18, 1968, as amended by CGFR 69-127, 35 FR 9975, June 17, 1970; CGFR 72-59R, 37 FR 6188, Mar. 25, 1972; CGD 73-254, 40 FR 40163, Sept. 2, 1975]

§ 52.01-3 Definitions of terms used in this part.

(a) *Types of boilers*—(1) *Main power boiler.* A main power boiler is a steam boiler used for generating steam for main propulsion.

(2) *Auxiliary or donkey boiler.* An auxiliary or donkey boiler is a steam boiler used for all purposes, including emergency propulsion, for which steam may be required other than main propulsion.

(3) *Watertube boiler.* A watertube boiler is a steam boiler in which the boiler tubes contain water and steam. The heat is applied to the outside surface of the tubes.

(4) *Internally fired firetube boiler (scotch boiler).* An internally fired firetube boiler is a steam boiler containing furnaces, one or more combustion chambers and tubes or flues, which are surrounded by water and through which the products of combustion pass from the furnace to the uptake. In such boilers no part of the shell is in contact with the fire or products of combustion.

(5) *Externally fired firetube or flue boiler (horizontal return tubular).* An externally fired firetube or flue boiler is a steam boiler, part of the outer shell of which is exposed to fire or to the products of combustion, and containing flues through which such products pass from the furnace to the uptake.

(6) *High temperature water boiler.* A high temperature water boiler is a boiler containing water at a temperature exceeding 250° F.

(7) *Packaged boiler.* A packaged boiler is a steam boiler equipped, and shipped complete with fuel burning equipment, mechanical draft equipment, feed water apparatus and all necessary controls for manual or automatic operation, all completely mounted on a common base and requiring only to be connected to fuel, water and electric supplies to be ready for use.

(8) *Fired steam boiler.* A pressure vessel in which steam is generated by the application of heat resulting from the combustion of fuel is classed as a fired steam boiler.

(9) *Unfired steam boiler.* A pressure vessel in which steam is generated by means other than fuel combustion is classed as an unfired steam boiler. (See § 54.01-10 of this subchapter.)

(b) *Parts of boilers*—(1) *Shell.* The shell is the structure forming the outer envelope of a boiler drum, or pressure vessel consisting of one or more plates properly joined (or of seamless construction) as specified in this part. This does not include tube sheets or heads.

(2) *Heads.* The heads are the ends of a boiler or pressure vessel. They may be flat or dished, stayed or unstayed.

(i) *Dished heads.* Dished heads are heads formed to a segment of a sphere or to a hemispherical or elliptical section and may be attached to the shell so that the pressure will be either on the concave or on the convex side.

(ii) *Stayed heads.* Stayed heads are heads supported in whole or in part by stays, furnaces, flues, tubes, etc.

(3) *Water wall.* A water wall is a series of tubes or elements spaced along or integral with a wall of a furnace to protect the wall and provide additional heating surface.

(4) *Header.* A header is a hollow forging, pipe, or welded plate of cylindrical, square, or rectangular cross section, serving as a manifold to which tubes are connected.

(5) *Superheater.* A superheater is an appliance for the purpose of increasing the temperature of steam.

(6) *Economizer.* An economizer is a feed-water heater usually located in the uptake or casing of a boiler to absorb heat from the waste gases.

(7) *Domes.* Domes are superstructures of shells, attached by riveting, bolting, or welding. They generally consist of a cylindrical shell with one

end flanged for attachment to the main shell and the other end closed by a head which may be integral with, riveted, or welded to the shell.

(8) *Steam chimneys.* Steam chimneys are superstructures of steam boilers which are fitted with a lining inside of which the products of combustion pass to the smokestack. They may be constructed in the form of a dome integral with the boiler or as independent steam vessels connected by piping to the boiler.

(9) *Furnace.* A furnace is a firebox or a large flue in which the fuel is burned.

(i) *Corrugated furnace.* A corrugated furnace is a cylindrical shell wherein corrugations are formed circumferentially for additional strength and to provide for expansion. (See Figure 52.20-10.)

(ii) *Purves ribbed furnace.* A purves ribbed furnace is a cylindrical shell in which ribs or projections are formed circumferentially to provide additional strength. (See Figure 52.20-10(f).)

(iii) *Adamson ring furnace.* An Adamson ring furnace is a cylindrical shell made in short sections, the ends of the sections being flanged and riveted together through a reinforcing ring. (See Figure 52.20-10(g).)

(iv) *Plain furnace.* A plain furnace is a cylindrical shell usually made in sections joined by means of riveting or welding.

(10) *Combustion chamber.* A combustion chamber is that part of an internally fired boiler in which combustible gases may be burned after leaving the furnace.

(i) *Separate combustion chamber.* A separate combustion chamber is a combustion chamber which is connected to one furnace only.

(ii) *Common combustion chamber.* A common combustion chamber is a combustion chamber connected to two or more furnaces in a bolier.

(iii) *Crown or top plate.* A crown or top plate is the top of a combustion chamber and is usually supported by girder stays or by sling stays or braces.

(iv) *Curved bottom plate.* A curved bottom plate is the bottom of a separate combustion chamber formed to an arc of a circle and usually designed to be self-supporting.

(v) *Combustion chamber tube sheet.* A combustion chamber tube sheet is the plate forming the end of a combustion chamber in which the tubes are secured.

(vi) *Combustion chamber back sheet.* A combustion chamber back sheet is the plate opposite the tube sheet forming the back of the combustion chamber. It is usually stayed to the back head of the boiler by means of screw staybolts, or, in the case of double-ended boilers, to the back of the combustion chamber of the other end of the boiler.

(11) *Flues.* Flues are cylindrical shells made of seamless or welded tubing, or with a riveted longitudinal joint, the ends being attached by riveting or welding. Their purpose is to provide additional heating surface and to form a path for the products of combustion.

(12) *Tubes.* Tubes are cylindrical shells of comparatively small diameter constituting the main part of the heating surface of a boiler or superheater.

(i) *Seamless tube.* A seamless tube is a tube without any longitudinal joint.

(ii) *Electric-resistance-welded tube.* An electric-resistance-welded tube is a tube the longitudinal joint of which is made by the electric-resistance butt welding process.

(iii) *Stay tube.* A stay tube is a thick-walled tube, the end of which is usually thickened by upsetting to compensate for threading. Such tubes are used for staying tube sheets into which they are screwed and expanded.

(13) *Tube sheet.* A tube sheet is a portion of a boiler drum, or header perforated for the insertion of tubes.

(14) *Ligament.* The ligament is the section of metal between the holes in a tube sheet.

(i) *Longitudinal ligament.* A longitudinal ligament is the minimum section of metal between two tube holes on a line parallel with the axis of the drum.

(ii) *Circumferential ligament.* A circumferential ligament is the minimum section of metal between two tube holes on a line around the circumference of the drum.

(iii) *Diagonal ligament.* A diagonal ligament is the minimum section of metal between two tube holes in adjacent rows, measured diagonally from one row to the other.

(c) *Stays and supports.* (1) *Surfaces to be stayed.* Surfaces to be stayed or reinforced include flat plates, heads, or areas thereof, such as segments of heads, wrapper sheets, furnace plates, side sheets, combustion chamber tops, etc., which are not self-supporting; and curved plates, constituting the whole or parts of a cylinder subject to external pressure, which are not entirely self-supporting.

(2) *Through stay.* A through stay is a solid bar extending through both heads of a boiler and threaded at the ends for attachment by means of nuts. With this type of stay the ends are usually upset to compensate for the threading. (See Figure 52.01-3(a).)

(3) *Solid screw staybolt.* A solid screw staybolt is a threaded bar screwed through the plates, the ends being riveted over or fitted with nuts or welded collars. (See Figure 52.01-3(b).)

(4) *Welded collar.* A welded collar is a beveled ring formed around the end of a screw stay by means of arc- or gas-welding. It is used in lieu of a nut. (See Figure 52.01-3(1).)

(5) *Hollow screw staybolt.* A hollow screw staybolt is a hollow threaded bar screwed through the plate, the ends being riveted over or fitted with nuts or welded collars. (See Figure 52.01-3(c).)

(6) *Flexible staybolt.* A flexible staybolt is a bar made with ball-and-socket joint on one end, the cup of the socket being screwed into the outside sheet and covered with a removable cap, the plain end of the staybolt being threaded, screwed through the inside sheet and riveted over. (See Figure 52.01-3(d).)

(7) *Sling stay.* A sling stay is a flexible stay consisting of a solid bar having one or both ends forged for a pin connection to a crowfoot or other structural fitting secured to the stayed plate. (See Figure 52.01-3(e).)

(8) *Crowfoot.* A crowfoot is a forged fitting with palms or lugs secured to the head to form a proper connection with a sling stay. (See Figure 52.01-3(f).)

(9) *Crowfoot stay.* A crowfoot stay is a solid bar stay terminating in a forged fork with palms or lugs for attachment to the plate. (See Figure 52.01-3(g).)

(10) *Diagonal stay.* A diagonal stay is a bar or formed plate forged with palms or lugs for staying the head of the boiler to the shell diagonally. (See Figure 52.01-3(h).)

(11) *Gusset stay.* A gusset stay is a triangular plate used for the same purpose as a diagonal stay and attached to the head and the shell by angles, flanges, or other suitable means of attachment. (See Figure 52.01-3(i).)

(12) *Dog stay.* A dog stay is a staybolt, one end of which extends through a girder, dog, or bridge, and is secured by a nut, the other end being screwed through the plate which it is supporting and riveted over or fitted with a nut or welded collar. (See Figure 52.01-3(j).)

(13) *Girder.* A girder is a bridge, built up of plates of structural shapes separated by distance pieces, a forging, or a formed plate, which spans an area requiring support, abutting thereon and supporting the girder stays or staybolts. (See Figure 52.01-3(k).)

(14) *Structural stiffeners.* Structural stiffeners are rolled shapes or flanged plates which are used to stiffen a surface which is not entirely self-supporting.

(15) *Reinforcement.* A reinforcement is a doubling plate, washer, structural shape, or other form for stiffening or strengthing a plate.

(d) *Pressure relief devices.* For boilers, pressure vessels, and pressure piping, a pressure relief device is designed to open to prevent a rise of internal fluid pressure in excess of a specified value due to exposure to emergency or abnormal conditions. It may also be designed to prevent excessive internal vacuum. It may be a pressure relief valve, a nonreclosing pressure relief device or a vacuum relief valve.

(1) *Pressure relief valve.* A pressure relief valve is a pressure relief device which is designed to reclose and prevent the further flow of fluid after normal conditions have been restored.

(i) *Safety valve.* A safety valve is a pressure relief valve actuated by inlet static pressure and characterized by rapid opening or pop action. Examples of types used on boilers include:

(*a*) *Spring-loaded safety valve.* A spring-loaded safety valve is a safety valve fitted with a spring which normally holds the valve disk in a closed position against the seat and allows it to open or close at predetermined pressures. Spring-loaded safety valves are characterized by pop action.

(*b*) *Pressure loaded pilot actuated safety valve.* A pressure loaded pilot actuated safety valve is one which is held in a closed position by steam pressure and controlled in operation by a pilot actuator valve.

(*c*) *Spring loaded pilot actuated safety valve.* A spring loaded, pilot actuated safety valve is one in which a spring is used in the conventional way to hold the disk against the seat, but which has a piston attached to the spindle and enclosed within a cylinder, which when subjected to a limiting or set pressure, unbalances the spring load thereby opening the valve.

(*d*) *Spring loaded pilot valve.* A spring loaded pilot valve is a conventional safety valve designed to actuate another spring loaded safety valve through a pressure transmitting line led from the body of the pilot valve.

(ii) *Relief valve.* A relief valve is a pressure relief valve actuated by inlet static pressure which opens in proportion to the increase in pressure over the opening pressure.

(iii) *Safety relief valve.* A safety relief valve is a pressure relief valve characterized by rapid opening or pop action, or by opening in proportion to the increase in pressure over the opening pressure, depending on application.

(*a*) *Conventional safety relief valve.* A conventional safety relief valve has its spring housing vented to the discharge side of the valve. The performance characteristics (opening pressure, closing pressure, lift and relieving capacity) are directly affected by changes of the back pressure on the valve.

(*b*) *Balanced safety relief valve.* A balanced safety relief valve incorporates means of minimizing the effect of back pressure on the operational characteristics (opening pressure, closing pressure, lift and relieving capacity).

(*c*) *Internal spring safety relief valve.* An internal spring safety relief valve incorporates the spring and all or part of the operating mechanism within the pressure vessel.

(iv) *Pilot operated pressure relief valve.* A pilot operated pressure relief valve is a pressure relief valve in which the major relieving device is combined with and is controlled by a self-actuated auxiliary pressure relief valve.

(v) *Power actuated relief valve.* A power actuated pressure relief valve is a pressure relief valve in which the major relieving device is combined with and controlled by a device requiring an external source of energy.

(vi) *Temperature actuated pressure relief valve.* A temperature actuated pressure relief valve is a pressure relief valve. A spring loaded, pilot actuated internal temperature.

(2) *Nonreclosing pressure relief device.* A nonreclosing pressure relief device is a pressure relief device not designed to reclose after operation.

(i) *Rupture disk device.* A rupture disk device is a device actuated by inlet static pressure and designed to function by the bursting of a pressure retaining disk.

(ii) *Explosion rupture disk device.* An explosion rupture disk device is a rupture disk device designed for use at high rates of pressure rise.

(iii) *Breaking pin device.* A breaking pin device is a device actuated by inlet static pressure and designed to function by the breakage of a load carrying section of a pin which supports a pressure retaining member.

(iv) *Shear pin device.* A shear pin device is a device actuated by inlet static pressure and designed to function by the shearing of a load carrying pin which supports the pressure retaining member.

(v) *Fusible plug device.* A fusible plug device is a device designed to function by the yielding or melting of a plug of suitable melting temperature.

(vi) *Frangible disk device.* A frangible disk device is the same as a rupture disk device.

(vii) *Bursting disk device.* A bursting disk device is the same as a rupture disk device.

(3) *Vacuum relief valve.* A vacuum relief valve is a valve designed to admit fluid to prevent an excessive internal vacuum.

(e) *Other boiler attachments.* (1) *Mountings.* Mountings are nozzle connections, distance pieces, valves, or fittings attached directly to the boiler.

(2) *Main steam stop valve.* A main steam stop valve is a valve usually connected directly to the boiler for the purpose of shutting off the steam from the main steam line.

(3) *Auxiliary steam stop valve.* An auxiliary steam stop valve is a valve usually connected directly to the boiler for the purpose of shutting off the steam from the auxiliary lines (including the whistle lines).

(4) *Manifold.* A manifold is a fitting with two or more branches having valves either attached by bolting or integral with the fitting.

(5) *Feed valve.* A feed valve is a valve in the feed-water line which controls the boiler feed.

(6) *Blowoff valve.* A blowoff valve is a valve connected directly to the boiler for the purpose of blowing out water, scum or sediment.

(7) *Dry pipe.* A dry pipe is a perforated or slotted pipe placed in the highest part of the steam space of a boiler to prevent priming.

(8) *Water column.* A water column is a fitting or tube equipped with a water glass attached to a boiler for the purpose of indicating the water level.

(9) *Test cocks.* Test cocks are small cocks on a boiler for indicating the water level.

(10) *Salinometer cocks.* Salinometer cocks are cocks attached to a boiler for the purpose of drawing off a sample of water for salinity tests.

(11) *Fusible plugs.* Fusible plugs are plugs made with a bronze casing and a tin filling which melts at a temperature of 445° to 450° F. They are intended to melt in the event of low water and thus warn the engineer on watch.

(f) *Boiler fabrication.* (1) *Repair.* Repair is the restoration of any damaged or impaired part to an effective and safe condition.

(2) *Alteration.* Alteration is a structural modification to or departure from an approved design or existing construction.

(3) *Expanding.* Expanding is the process of enlarging the end of a tube to make it fit tightly in the tube sheet.

(4) *Beading.* Beading is the process of turning over the protruding end of a tube after expanding to form a supporting collar for the tube sheet.

(5) *Bell-mouthing.* Bell-mouthing is the process of flaring the end of a tube beyond where it is expanded in the tube sheet.

(6) *Telltale hole.* A telltale hole is a small hole having a diameter not less than three-sixteenths inch drilled in the center of a solid stay, and extending to at least one-half inch beyond the inside surface of the sheet.

(7) *Access or inspection openings.* Access or inspection openings are holes cut in the shells or heads of boilers or boiler pressure part for the purpose of inspection and cleaning.

(8) *Openings.* Openings are holes cut in shells or heads of boilers or boiler pressure parts for the purpose of connecting nozzles, domes, steam chimneys, or mountings.

(g) *Pressure.* The term pressure is an abbreviation of the more explicit expression "difference in pressure intensity." It is measured in terms such as pounds per square inch (p.s.i.).

(1) *Gage (or gauge) pressure.* Gage pressure is the difference between the pressure at the point being measured and the ambient pressure for the gage. It is measured in units such as pounds per square inch gage (p.s.i.g.).

(2) *Absolute pressure.* Absolute pressure is the difference between the pressure at the point being measured and that of a perfect vacuum. It is measured in units such as pounds per square inch absolute (p.s.i.a.).

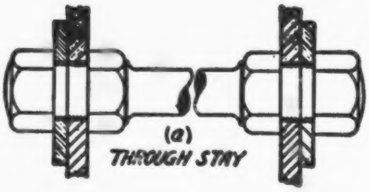
(3) *Internal pressure.* Internal pressure refers to a situation where the pressure inside exceeds that outside the volume being described.

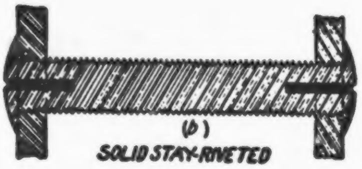
(4) *External pressure.* External pressure refers to a situation where the pressure outside exceeds that inside the volume being described.

(5) *Maximum allowable working pressure.* For a definition of maximum

allowable working pressure, see § 54.10-5 of this subchapter.

[CGFR 68-82, 33 FR 18815, Dec. 18, 1968, as amended by CGFR 69-127, 35 FR 9976, June 17, 1970]


(a) THROUGH STAY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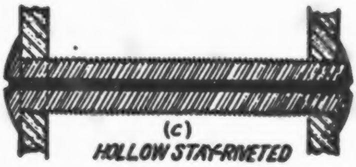
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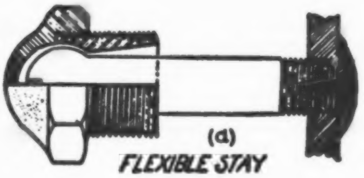
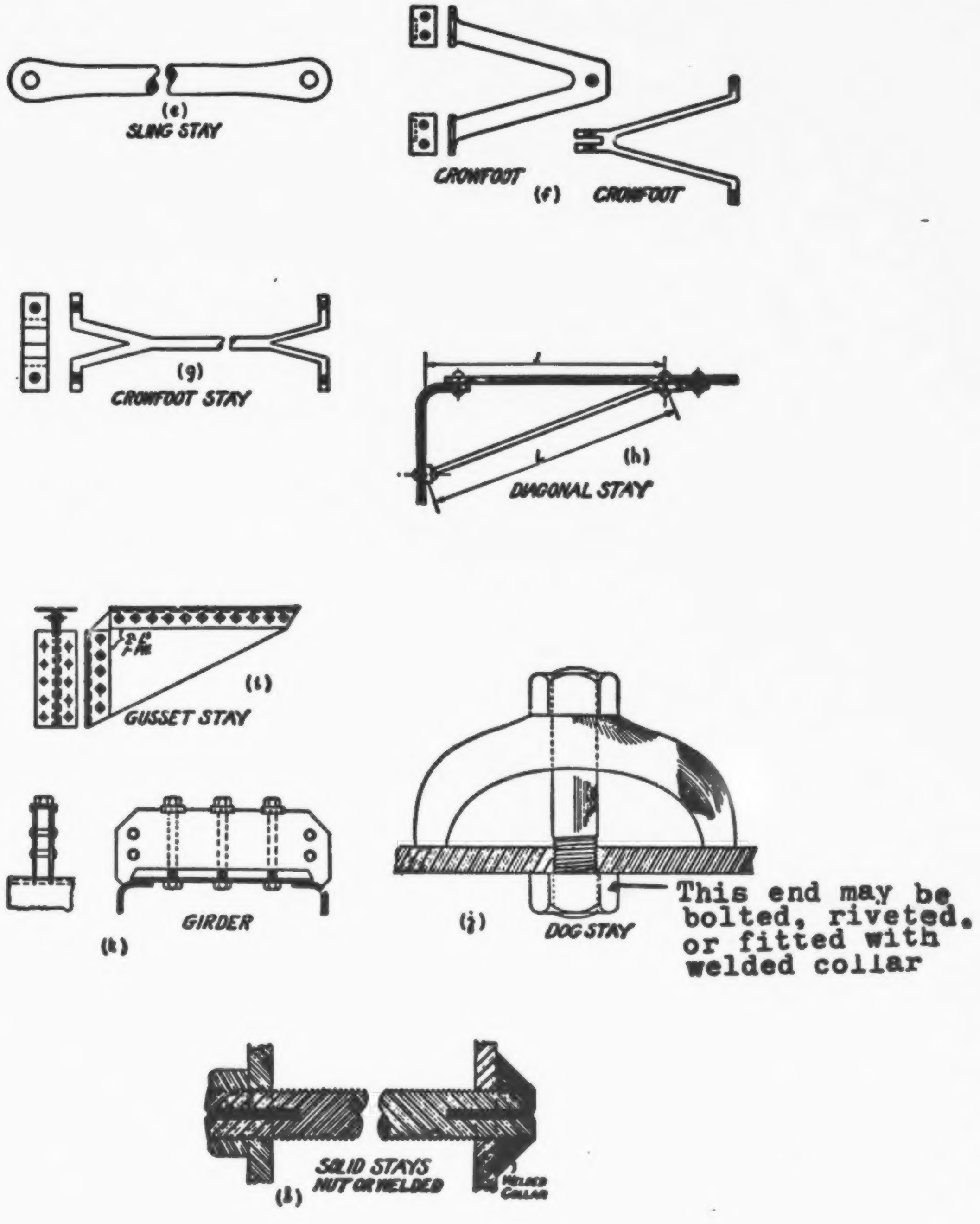

(d) FLEXIBLE STAY


(e)
SLING STAY
CROWFOOT
(f)
CROWFOOT
(g)
CROWFOOT STAY
l
L
(h)
DIAGONAL STAY
(i)
GUSSET STAY
(j)
DOG STAY
GIRDER
(k)
SOLID STAYS
NUT OR WELDED
(l)
WELDED COLLAR

This end may be bolted, riveted, or fitted with welded collar

FIGURE 52.01-3—Acceptable Types of Boiler Stays.

§ 52.01-5 Plans.

(a) Manufacturers intending to fabricate boilers of riveted, welded, or seamless material to be installed on vessels shall submit detail plans as indicated in Subpart 50.20 of this subchapter.

§ 52.01-10 Automatic controls.

(a) Each automatically controlled main boiler shall meet special requirements for controls and safety shutdown as determined by the Commandant.

(b) Each automatically controlled auxiliary boiler shall meet the special requirements of Part 63 of this subchapter.

§ 52.01-35 Auxiliary, donkey, fired thermal fluid heater, and heating boilers.

(a) To determine the appropriate part of the regulations where requirements for miscellaneous boiler types, such as donkey, fired thermal fluid heater, heating boiler, etc., may be found, refer to Table 54.01-5(a) of this subchapter.

(b) Fired vessels in which steam is generated at pressures exceeding 30 pounds per square inch gage shall meet the requirements of this part.

§ 52.01-40 Materials and workmanship.

All materials to be used in any of the work specified in the various sections of this part shall be free from injurious defects and shall have a workmanlike finish. The construction work shall be executed in a workmanlike manner with proper tools or equipment and shall be free from defects which would impair strength or durability.

§ 52.01-50 Fusible plugs (replaces A-19 through A-21).

(a) All boilers, except watertube boilers and low-pressure heating boilers operating at pressures not in excess of 30 pounds per square inch, shall be fitted with fusible plugs from acceptable heats manufactured in accordance with Subpart 162.014 of Subchapter Q (Specifications) of this chapter.

(b) Vertical boilers shall be fitted with one fusible plug located in a tube not more than 2 inches below the lowest gage cock.

(c) Externally fired cylindrical boilers with flues shall have one plug fitted to the shell immediately below the fire line not less than 4 feet from the front end.

(d) Firebox, Scotch, and other types of shell boilers not specifically provided for, having a combustion chamber common to all furnaces, shall have one plug fitted at or near the center of the crown sheet of the combustion chamber.

(e) Double-ended boilers, having individual combustion chambers for each end, in which combustion chambers are common to all the furnaces in one end of the boiler, shall have one plug fitted at or near the center of the crown sheet of each combustion chamber.

(f) Boilers constructed with a separate combustion chamber for each individual furnace shall be fitted with a fusible plug in the center of the crown sheet of each combustion chamber.

(g) Boilers of types not provided for in this section shall be fitted with at least one fusible plug of such dimensions and located in a part of the boiler as will, in the judgment of the marine inspector, best meet the purposes for which it is intended.

(h) Fusible plugs shall be so fitted that the smaller end of the filling is in direct contact with the radiant heat of the fire, and shall be at least 1 inch higher on the water side than the plate or flue in which they are fitted, and in no case more than 1 inch below the lowest permissible water level.

(i) The lowest permissible water level shall be determined as follows:

(1) Vertical firetube boilers, one-half of the length of the tubes above the lower tube sheets.

(2) Vertical submerged tube boilers 1 inch above the upper tube sheet.

(3) Internally fired firetube boilers with combustion chambers integral with the boiler, 2 inches above the highest part of the combustion chamber.

(4) Horizontal-return tubular and dry back Scotch boilers, 2 inches above the top row of tubes.

(j) The lowest permissible water level for all water-tube boilers shall be determined at the time the plans of the boilers are submitted for approval.

(k) (1) Fusible plugs shall be cleaned and will be examined by the marine inspector at each inspection for certification, and oftener if necessary. If in the marine inspector's opinion the condition of any plug is satisfactory, it may be continued in use.

(2) When fusible plugs are renewed at other than the inspection for certification and no marine inspector is in attendance, the Chief Engineer shall submit a written report to the Officer in Charge, Marine Inspection, who issued the certificate of inspection informing him of the renewal. This letter report shall contain the following information:

(i) Name and official number of vessel.

(ii) Date of renewal of fusible plugs.

(iii) Number and location of fusible plugs renewed in each boiler.

(iv) Manufacturer and heat number of each plug.

(v) Reason for renewal.

(l) Fusible plugs shall not be permitted where the maximum steam temperature to which they are exposed exceeds 425° F.

§ 52.01-55 Increase in maximum allowable working pressure.

(a) When the maximum allowable working pressure of a boiler has been established, an increase in the pressure settings of its safety valves shall not be granted unless the boiler design meets the requirements of this subchapter in effect at the time the boiler was contracted for or built; but in no case will a pressure increase be authorized for boilers constructed prior to the effective date of the regulations dated November 19, 1952, if the minimum thickness found by measurement shows that the boiler will have a factor of safety of less than 4½. The piping system, machinery, and appurtenances shall meet the present requirements of this subchapter for the maximum allowable working pressure requested. An increase in pressure shall be granted only by the Commandant upon presentation of data or plans proving that the requested increase in pressure is justified.

(b) When an existing boiler is replaced by a new boiler designed to operate at pressures in excess of the pressure indicated on the certificate of inspection for the previous boiler, an analysis of the complete system shall be made, including machinery and piping, to insure its compatibility with the increased steam pressure. The maximum allowable working pressure on the certificate of inspection shall be based on the results of this analysis.

§ 52.01-90 Materials (modifies PG-5 through PG-13).

(a) Materials subject to stress due to pressure shall conform to specifications as indicated in paragraph PG-5 through PG-13 of the ASME Code except as noted otherwise in this section.

(b) Material not fully identified with an ASME Code approved specification may be accepted as meeting Coast Guard requirements provided it satisfies the conditions indicated in paragraph PG-10 of the ASME Code.

(c) Miscellaneous pressure parts shall be as required by paragraph PG-11 except that welded pressure parts (other than the shell of a vessel), such as pipe fittings, shall meet the requirements of Subpart 56.15 of this subchapter.

(d) (Modifies PG-5.5) When the maximum allowable working pressure (See PG-21) exceeds 15 pounds per square inch, cross pipes connecting the steam and water drums of water tube boilers, headers, cross boxes and all pressure parts of the boiler proper shall be made of a wrought or cast steel listed in Table PG-23.1 of the ASME Code.

(e) Non-ferrous materials are not permitted for pipes up to the first joint on all outlets but are permitted for instrument piping and may be used in blowoff or drain service provided pressure is below 250 pounds per square-inch gage and temperature is below 400° F.

(f) (Modifies PG-8.2.2.) The use of cast iron for mountings, fittings, valves, or cocks attached directly to boilers operating at pressures exceeding 15 pounds per square inch is prohibited.

(g) (Modifies PG-12.) Rivets of Specification SA-202 material are also acceptable.

(h) (Modifies PG-11.1.1.) The material, design, construction and workmanship of pumps shall be at least equivalent to the standards established by the American Bureau of Shipping or other recognized classification society. See Part 58 of this subchapter.

(i) (Modifies PG-5.4.) With the Commandant's permission, materials outside the limits of thickness given in the title or scope clause of any specification in section II of the ASME Code may be used if the material is in compliance with the other requirements of the specification and no similar limitation is given in this part.

[CGFR 68-82, 33 FR 18815, Dec. 18, 1968, as amended at CGD 73-254, 40 FR 40163, Sept. 2, 1975]

§ 52.01-95 Design (modifies PG-16 through PG-31 and PG-100).

(a) *Requirements.* Boilers required to be designed to this part shall meet the requirements of PG-16 through PG-31 of the ASME Code except as noted otherwise in this section.

(b) *Superheater.* (1) The design pressure of a superheater integral with the boiler shall not be less than the lowest setting of the drum safety valve, except that outlet connections shall be designed in accordance with Subpart 56.15 of this subchapter.

(2) Controls shall be provided to insure that the maximum temperature at the superheater outlets does not exceed the allowable temperature limit of the material used in the superheater outlet, in the steam piping, and in the associated turbo machinery under all normal operating conditions including boiler overload. Controls need not be provided if the operating superheater characteristic is demonstrated to be such that the temperature limits of the material will not be exceeded. Visible and audible alarms indicating excessive superheat shall be provided in any installation in which the superheater outlet temperature exceeds 850° F.

(3) Arrangement shall be made for venting and draining the superheater in order to permit steam circulation through the superheater when starting the boiler.

(c) *Economizer.* The design pressure of an economizer integral with the boiler and connected to the boiler drum without intervening stop valves shall be at least equal to 110 percent of the highest setting of the safety valves on the drum.

(d) *Brazed boiler steam air heaters.* Boiler steam air heaters utilizing brazed construction are permitted at temperature not exceeding 525° F. Refer to § 56.30-30(b)(1) of this subchapter for applicable requirements.

(e) *Experimental determination of pressure rating.* (*Modifies PG-18 and PG-100.*) (1) Where approval is requested for a boiler pressure part which, due to its irregular form, process of manufacture, or for any other reason, becomes a new or difficult subject for accurate mathematical analysis, the Commandant may require a full size specimen to be tested to determine a safe and fair pressure rating for such pressure vessel or pressure part.

(2) In lieu of the proof hydrostatic tests as prescribed in A-22 of the ASME Code appendix, the Commandant may permit the use of empirical formulas for determining the maximum allowable working pressure of boiler pressure parts of irregular form, or where the stresses cannot be accurately determined. The empirical formulas shall be based upon proof hydrostatic test data acceptable to the Commandant.

(f) *Stresses.* (*Modifies PG-22*). The stresses due to hydrostatic head shall be taken into account in determining the minimum thickness of the shell or head of any boiler pressure part unless noted otherwise. Additional stresses, imposed by effects other than internal pressure or static head, which increase the average stress over substantial sections of the shell or head by more than 10 percent of the allowable stress shall be taken into account. These effects include the weight of the vessel and its contents, method of support, impact loads, superimposed loads, localized stresses due to the reactions of supports, stresses due to temperature gradients and dynamic effects.

(g) *Cylindrical components under internal pressure.* (*Modifies PG-27.*) The minimum required thickness and maximum allowable working pressure of boiler piping, tubes, drums and headers shall be as required by the formula in PG-27 of the ASME Code except that threaded boiler tubes are not permitted.

§ 52.01-100 Openings and compensation (modifies PG-32 through PG-39, PG-43 through PG-55, replaces PG-42).

(a) The rules for openings and compensation shall be as indicated in PG-32 through PG-55 of the ASME Code except as noted otherwise in this section.

(b) (Modifies PG-34.) Flanged-in manhole openings in a dished head shall be flanged to a minimum radius measured on the inside of the plate of not less than seven-eighths inch for plates up to and including 1⅛ inches in thickness, and for plates exceeding 1⅛ inches in thickness, the radius shall be increased proportionately.

(c) (Modifies PG-34.) The inner radius of the bend of any flanged opening in heads, except manholes or other access openings as specified in paragraph (b) of this section, shall, for furnace attachments, be not less than one and one-half times the thickness of the plate flanged.

(d) When handhole or other access openings are made, a margin of not less than one-fourth inch shall be left when punching operations are used, and not less than one-eighth inch shall be left when machine burning methods are employed. Such margins shall be machined or ground away to relieve the metal of any stresses which may be set up due to burning or punching operations.

(e) (Modifies PG-39.) Pipe and nozzle necks shall be attached to vessel walls as indicated in PG-39 except that threaded connections shall not be used under any of the following conditions:

(1) Pressures greater than 600 pounds per square inch gage;

(2) Nominal diameters greater than 2 inches; or

(3) Nominal diameters greater than three-fourths inch and pressures above 150 pounds per square inch gage.

(f) (Replaces PG-42.) Connections for pipe, piping fittings, and valves shall meet the appropriate requirements of Part 56 of this subchapter in lieu of PG-42 of the ASME Code.

(g) (Modifies PG-49.) The length of a staybolt shall not exceed 20 diameters of the staybolt.

(h) (Modifies PG-47.) The minimum thickness of nuts used in connection with screw stays shall be one-half of the nominal thread diameter of the stay, but in no case less than three-fourths inch. The stays shall be so placed in relation to the joints that the plates can be calked without removing the nuts.

(i) Handhole covers may be seals welded to provide tightness.

[CGFR 68-82, 33 FR 18815, Dec. 18, 1968, as amended by CGD 73-254, 40 FR 40163, Sept. 2, 1975]

§ 52.01-105 Piping, valves and fittings (replaces PG-58 and PG-59).

(a) *Piping system components.* All piping system components shall meet the appropriate requirements of Part 56 of this subchapter. These systems include steam (drum to superheater, desuperheated steam), feed water, drain, and blow-off piping. Parts of boilers fabricated from pipe material such as drums, shells, downcomers, risers, cross pipes, headers, and tubes shall meet the requirements of this part with the exception of the nondestructive testing of circumferentially welded butt joints. (See § 52.05-20.) The circumferential joint connecting the piping system to the boiler component shall be considered to be part of the piping system (Part 56 of this subchapter) for the purposes of design, inspection, and testing.

(b) *Feed connections.* (1) Feed water shall not be discharged into a boiler against surfaces exposed to hot gases or radiant heat of the fire or close to a riveted joint.

(2) Feed water nozzles of boilers designed for pressures of 400 pounds per square inch, or over, shall be fitted with sleeves or other suitable means

employed to reduce the effects of metal temperature differentials.

(c) *Blowoff connections.* (1) Firetube and drum type boilers shall be fitted with a surface and a bottom blowoff valve or cock attached directly to the boiler or to a short distance piece. The surface blow-off valve shall be located within the permissible range of the water level, or fitted with a scum pan or pipe at this level. The bottom blowoff valve shall be attached to the lowest part of the boiler or fitted with an internal pipe leading to the lowest point inside the boiler. Watertube boilers designed for pressures of 350 pounds per square inch gage or over are not required to be fitted with a surface blowoff valve. Boilers equipped with a continuous blowdown valve on the steam drum are not required to be fitted with an additional surface blowoff connection.

(2) Where blowoff pipes are exposed to radiant heat of the fire, they shall be protected by fire brick or other suitable heat-resisting material.

(d) *Dry pipes.* Internal dry pipes may be fitted to the steam drum outlet, provided such dry pipes have a diameter equal to the outlet and a wall thickness at least equal to standard commercial pipe thickness for their diameter. Openings in dry pipes shall be as near as practicable to the drum outlet and shall be slotted or drilled, the width of the slots to be not less than one-quarter inch, or the diameter of the holes to be not less than three-eighths inch. Where dry pipes are used, they shall be provided with drains at each end to prevent an accumulation of water.

§ 52.01–110 Water level indicators, water columns, gage glass connections, gage cocks, and pressure gages (modifies PG–60).

(a) *Boiler water level devices.* Boiler water level devices shall be as indicated in PG–60 of the ASME Code except as noted otherwise in this section.

(b) *Water level indicators (modifies PG–60.1).* (1) Each boiler except those of the forced circulation type with no fixed water line and steam line, shall have two independent means of indicating the water level in the boiler connected directly to the head or shell. One shall be a gage glass or multiport bicolor gage lighted by the emergency electrical system (See Subpart 112.15 of Subchapter J (Electrical Engineering) of this chapter) which will insure illumination of the gages under all normal and emergency conditions. The secondary indicator may consist of a gage glass, or other device approved by the Commandant. Where the allowable pressure exceeds 250 pounds per square inch, the gage glasses shall be of the flat type instead of the common tubular type.

(2) Gage glasses shall be in continuous operation while the boiler is steaming.

(3) Double-ended firetube boilers shall be equipped as specified in this paragraph and paragraph (e) of this section except that the required water level indicators shall be installed on each end of the boiler.

(4) Externally fired flue boilers, such as are used on central western river vessels, shall be equipped as specified in paragraphs (b) (1) through (3) of this section except that float gages may be substituted for gage glasses.

(c) *Water columns (modifies PG–60.2).* The use of water columns is generally limited to firetube boilers. Water column installations shall be close hauled to minimize the effect of ship motion on water level indication. When water columns are provided they shall be fitted directly to the heads or shells of boilers or drums by 1 inch minimum size pipes with shutoff valves attached directly to the boiler or drums, or if necessary, connected thereto by a distance piece both at the top and bottom of the water columns. Shutoff valves used in the pipe connections between the boiler and water column or between the boiler and the shutoff valves required by PG–60.6 of the ASME Code for gage glasses, shall be locked or sealed open. Water column piping shall not be fitted inside the uptake, the smoke box, or the casing. Water columns shall be fitted with suitable drains. Cast iron fittings are not permitted.

(d) *Gage glass connections (modifies PG–60.3).* Gage glasses and gage cocks shall be connected directly to the head or shell of a boiler as indicated in paragraph (b)(1) of this section. When water columns are authorized, connections to the columns may be made provided a close hauled arrangement is utilized so that the effect of ship roll on the water level indication is minimized.

(e) *Gage cocks (modifies PG-60.4).* (1) When the steam pressure does not exceed 250 pounds per square inch, three test cocks attached directly to the head or shell of a boiler may serve as the secondary water level indicator.

(2) See paragraph (d) of this section for restrictions on cock connections.

(f) *Pressure gages (modifies PG-60.6).* Each double-ended boiler shall be fitted with two steam gages, one on either end on the boiler.

(g) *Salinometer cocks.* In vessels operating in salt water, each boiler shall be equipped with a salinometer cock or valve which shall be fitted directly to the boiler in a convenient position. They shall not be attached to the water gage or water column.

(h) (Modifies PG-60) Piping referred to in this section must meet the requirement of Part 56 of this subchapter.

[CG FR 68-82, 33 FR 18815, Dec. 18, 1968, as amended by CGD 73-254, 40 FR 40163, Sept. 2, 1975]

§ 52.01-115 Feedwater supply (replaces PG-61).

Refer to § 56.50-30 of this subchapter for applicable requirements. The feedwater supply requirements in § 56.50-30 of this subchapter shall be followed in lieu of PG-61 of the ASME Code.

§ 52.01-120 Safety valves and safety relief valves (modifies PG-67 through PG-72).

(a)(1) Boiler safety valves and safety relief valves shall be as indicated in PG-67 through PG-72 of the ASME Code except as noted otherwise in this section.

(2) Propulsion boilers and their superheaters must have approved safety valves that meet the requirements in Subpart 162.001 of Part 162 of this chapter. Auxiliary boilers or unfired steam generators must have approved safety valves that meet the requirements in Subpart 162.001 or Subpart 162.002 of Part 162 of this chapter. The total rated relieving capacity of the approved safety valves must meet the requirements in § 52.01-120(a)(4).

(3) On river steam vessels whose boilers are connected in batteries without means of isolating one boiler from another, each battery of boilers shall be treated as a single boiler and equipped with not less than two safety valves of equal size.

(4) (Modifies PG-70.) The total rated relieving capacity of drum and superheater safety valves as certified by the valve manufacturer shall not be less than the maximum generating capacity of the boiler which shall be determined and certified by the boiler manufacturer. This capacity shall be in compliance with PG-70 of the ASME Code.

(5) In the event the maximum steam generating capacity of the boiler is increased by any means, the relieving capacity of the safety valves shall be checked by an inspector, and, if determined to be necessary, valves of increased relieving capacity shall be installed.

(6) (Modifies PG-67.) Drum safety valves shall be set to relieve at a pressure not in excess of that allowed by the approved plans or the Certificate of Inspection. Where for any reason this is lower than the pressure for which the boiler was originally designed and the revised safety valve capacity cannot be recomputed and certified by the valve manufacturer, one of the tests described in PG-70(3) of the ASME Code shall be conducted in the presence of an Inspector to insure that the relieving capacity is sufficient at the lower pressure.

(7) On new installations the safety valve nominal size for propulsion boilers and superheaters must not be less than 1½ inches nor more than 4 inches. Safety valves 1½ to 4½ inches may be used for replacements on existing boilers. The nominal size of a safety valve is the nominal diameter (as defined in § 56.07-5(b)) of the inlet opening.

(8) Lever or weighted safety valves now installed may be continued in use and may be repaired, but when renewals are necessary, lever or weighted safety valves shall not be used. All

such replacements shall conform to the requirements of this section.

(9) Gags or clamps for holding the safety valve disk on its seat shall be carried on board the vessel at all times.

(b)(1) (Modifies PG–68.) Superheater safety valves shall be as indicated in PG–68 of the ASME Code except as noted otherwise in this paragraph.

(2) The setting of the superheater safety valve shall not exceed the design pressure of the superheater outlet flange or the main steam piping beyond the superheater. To prevent damage to the superheater, the drum safety valve shall be set at a pressure not less than that of the superheater safety valve setting plus 5 pounds minimum plus approximately the normal load pressure drop through the superheater and associated piping, including the controlled desuperheater if fitted. See also § 52.01–95(b)(1).

(3) Installations employing drum pilot actuated superheater safety valves will be specially considered by the Commandant. See also § 56.50–15(b) of this subchapter.

(c)(1) (Modifies PG–71.) Safety valves shall be installed as indicated in PG–71 of the ASME Code except as noted otherwise in this paragraph.

(2) The final setting of boiler safety valves shall be checked and adjusted under steam pressure and, if possible, while the boiler is on the line and the steam is at operating temperatures, in the presence of and to the satisfaction of a marine inspector who, upon acceptance, shall seal the valves. This regulation applies to both drum and superheater safety valves of all boilers.

(3) The safety valve body drains required by PG–71 of the ASME Code shall be run as directly as possible from the body of each boiler safety valve, or the drain from each boiler safety valve may be led to an independent header common only to boiler safety valve drains. No valves of any type shall be installed in the leakoff from drains or drain headers and they shall be led to suitable locations to avoid hazard to personnel.

(d)(1) (Modifies PG–72.) The operation of safety valves shall be as indicated in PG–72 of the ASME Code except as noted in paragraph (2) of this section (d).

(2) The lifting device required by PG–72.4 of the ASME Code shall be fitted with suitable relieving gear so arranged that the controls may be operated from the fireroom or engineroom floor.

[CGFR 68–82, 33 FR 18815, Dec. 18, 1968, as amended by CGFR 72–59R, 37 FR 6188, Mar. 25, 1972]

§ 52.01–125 Fabrication (modifies PG–75 through PG–82).

(a) *Requirements.* The fabrication of boilers and parts there of shall be as indicated in PG–75 through PG–82 of the ASME Code except as noted otherwise in this section.

(b) *Cracked plates.* Plates which crack during cold forming operations as a result of localized stress raisers, such as sharp plate edges, minor localized surface imperfections, and fractures which subsequent microstructure examination shows to be caused by coarse grain size may be repaired if authorized by the Commandant. Prior to such repairs being authorized, information as appropriate shall be furnished regarding:

(1) Heat treatment to be employed prior to undertaking repairs;

(2) Method of excavating defective material and type of groove to be employed;

(3) Method of examining excavation to insure that all defective material has been removed;

(4) Welding procedure to be employed in effecting the repair;

(5) Heat treatment to be employed during and after welding; and,

(6) Type of nondestructive test to be made to insure that repair is satisfactory.

(c) *Laminations.* Laminations or inclusions in the plate which initially appear in the heat affected zone during welding operations or appear during the drilling of tube holes may be repaired if authorized by the Commandant. Prior to such repair being authorized, information, as appropriate, shall be furnished regarding:

(1) Method of excavating defective material and type of welding groove to be used;

(2) Method of examining excavation to insure that all defective material has been removed;

(3) Welding procedure to be employed in effecting repair;

(4) Heat treatment to be employed during and after welding; and,

(5) Type of nondestructive test to be made to insure that repair is satisfactory.

§ 52.01-130 Installation.

(a) *Foundations.* (1) Plans showing details of proposed foundations and support for boilers and the proposed means of bracing boilers in the vessel shall be submitted for approval to the Officer in Charge, Marine Inspection, in the district where the installation is being made.

(2) Provision shall be made in foundations for expansion of the boilers when heated.

(3) Boilers shall be provided with chocks to prevent movement in the event of collision unless a bolted or riveted construction satisfactorily provides for this contingency.

(b) *Protection of adjacent structure.* (1) Boilers shall be so placed that all parts are readily accessible for inspection and repair.

(2) In vessels having a double bottom or other extensive surfaces directly below the boiler, the distance between such surface and a boiler shall in no case be less than 18 inches at the lowest part.

(3) In certain types of vessels where the boiler foundation forms the ashpit, such foundations shall be efficiently ventilated, except in cases where the ashpit is partially filled with water at all times.

(4) The pans of oil-burning, water-tube boilers shall be arranged to prevent oil from leaking into the bilges and shall be lined with firebrick or other heat resisting material.

(5) The distance between a boiler and a compartment containing fuel oil shall not be less than 24 inches at the back end of a boiler and 18 inches elsewhere, except that for a cylindrical part of a boiler or a knuckle in the casing of a water-tube boiler, these distances may be reduced to 18 inches, provided all parts are readily accessible for inspection and repair.

(6) All oil-burning boilers shall be provided with oiltight drip pans under the burners and elsewhere as necessary to prevent oil draining into the bilges.

(c) *Boiler uptakes.* (1) Where dampers are installed in the uptakes or funnels, the arrangement shall be such that it will not be possible to shut off the gas passages from the operating boilers.

(2) Each main power boiler and auxiliary boiler shall be fitted with a separate gas passage.

§ 52.01-135 Inspection and tests (modifies PG-90 through PG-100).

(a) *Requirements.* Inspection and test of boilers and boiler pressure parts shall be as indicated in PG-90 through PG-100 of the ASME Code except as noted otherwise in this section.

(b) *Inspector (modifies PG-91).* The "Inspector" shall be the "Marine Inspector" as defined in § 50.10-15 of this subchapter.

(c) *Hydrostatic test (modifies PG-99).* Each new boiler shall be hydrostatically tested after installation to 1½ times the maximum allowable working pressure as indicated in PG-99 of the ASME Code. Before the boilers are insulated, accessible parts of the boiler shall be emptied, opened up and all interior surfaces shall be examined to ascertain that no defects have occurred due to the hydrostatic test.

(d) *Operating tests.* In addition to the hydrostatic tests prescribed in this section, automatically controlled auxiliary boilers shall be subjected to operating tests as specified in § 63.05-90 or § 63.10-90 of this subchapter as appropriate, or as directed by the Commandant for propulsion boilers. These tests are to be performed after final installation.

[CGFR 68-82, 33 FR 18815, Dec. 18, 1968, as amended by CGFR 69-127, 35 FR 9976, June 17, 1970]

§ 52.01-140 Certification by stamping (modifies PG-105 through PG-113).

(a) The marine inspector (see § 50.10-15 of this subchapter) shall affix the Coast Guard symbol to main power boilers and to auxiliary boilers. Stamping with the ASME Code symbol stamps, as indicated in PG-105 through PG-113 of the ASME Code, is not required for main power boilers and auxiliary boilers and a manufacturer need not possess ASME Code symbol stamps (see § 50.15-5(c) of this subchapter).

(1) Those heating boilers which are built to section I of the ASME Code, as permitted by § 53.10-5 of this subchapter, do not require Coast Guard inspection or stamping, and shall receive full ASME stamping including the appropriate code symbol.

(b) Upon satisfactory completion of the tests and Coast Guard inspections, main power boilers and auxiliary boilers shall be stamped, on the front head or shell near the normal waterline and within 24 inches of the front of firetube boilers and on the drum head of watertube boilers, with the following:

(1) Manufacturer's name and serial number.

(2) Coast Guard number, see § 50.10-30 of this subchapter.

(3) Coast Guard symbol, which is affixed only by the marine inspector.

(4) Maximum allowable working pressure ——— at ——— °F.

(5) Boiler rated steaming capacity in pounds per hour (rated B.T.U./hr. output for high temperature water boilers).

(c) The data shall be legibly stamped and shall not be obliterated during the life of the boiler. In the event that the portion of the boiler upon which the data is stamped is to be insulated or otherwise covered, a metal nameplate as described in PG-106.6 of the ASME Code shall be furnished and mounted. The Coast Guard symbol shall be used instead of the ASME symbol on such plates and may only be affixed in the presence of a marine inspector. The nameplate is to be maintained in a legible condition so that the data may be easily read.

(d)(1) When only a pressure part of a boiler is supplied, the applicable data shall be recorded on the Manufacturers' data form as "Partial". The item shall be stamped with the Coast Guard symbol, the Marine Inspection Office identification letters (See § 50.10-30 of this chapter) and the word "Part", the manufacturer's name and serial number, and the maximum working pressure.

(2) The Officer in Charge, Marine Inspection, who makes the final tests and inspection of the boiler as a whole shall assign the Coast Guard Number to the boiler in accordance with paragraph (b) of this section.

(e) PG-107 through PG-109 of the ASME Code do not apply. Field assembly of completed and stamped (less the Coast Guard number) individual boiler components at a shipyard is permitted. The manufacturer or assembler responsible for the completed boiler unit which is field assembled shall submit the final data report form.

(f) Safety valves shall be stamped as indicated in PG-110 of the ASME Code as modified by Subpart 162.001 of Subchapter Q (Specifications) of this chapter.

[CGFR 68-82, 35 FR 18815, Dec. 18, 1968, as amended by CGFR 69-127, 35 FR 9976, June 17, 1970; 35 FR 12205, July 30, 1970]

§ 52.01-145 Manufacturers' data report forms (modifies PG-112 and PG-113).

(a) The Manufacturers' data report form, as provided by the Coast Guard, shall be completed in duplicate and certified by the manufacturer for each power boiler required to be shop inspected under these regulations. The original of this form shall be delivered to the Coast Guard inspector.

(b) Data forms for those parts of a power boiler requiring inspection, which are furnished by other than the shop of the manufacturer responsible for the completed unit, shall be executed in triplicate by the parts manufacturer. The original and one copy shall be delivered to the Coast Guard Inspector who shall forward one copy of the report to the Officer in Charge, Marine Inspection having cognizance over the final assembly. These partial data reports, together with the final inspection and tests, shall be the final Coast Guard inspector's authority to apply the Coast Guard symbol and number. A final data report shall be executed by the manufacturer or assembler who completes the final assembly and tests.

[CGFR 69-127, 35 FR 9976, June 17, 1970; 35 FR 12205, July 30, 1970]

Subpart 52.05—Requirements for Boilers Fabricated by Welding

§ 52.05-1 General (modifies PW-1 through PW-54).

(a) Boilers and component parts, including piping, that are fabricated by welding shall be as indicated in PW-1 through PW-54 of the ASME Code except as noted otherwise in this subpart.

§ 52.05-5 Scope and responsibility (modifies PW-1).

(a) Boilers and component parts thereof that are fabricated by welding shall be as indicated in PW-1 of the ASME Code except as noted otherwise in this section.

(b) The qualification of welding procedures and welders shall be as required by Part 57 of this subchapter.

§ 52.05-10 Design (modifies PW-8 through PW-19).

(a) The design of welded boilers and parts thereof shall be as indicated in PW-8 through PW-19 of the ASME Code except as noted otherwise in §§ 52.05-20, 52.05-25, 52.05-30, and 52.05-35.

§ 52.05-15 Heat treatment (modifies PW-10).

(a) Vessels and vessel parts shall be preheated and postweld heat treated in accordance with PW-38 and PW-39 of the ASME Code (reproduces PW-10). This includes boiler parts made of pipe material even though they may be nondestructively examined under § 52.05-20.

§ 52.05-20 Radiographic and ultrasonic examination (modifies PW-11 and PW-41.1).

(a) Radiographic and ultrasonic examination of welded joints shall be as described in PW-11 of the ASME Code except that parts of boilers fabricated of pipe material, such as drums, shells, downcomers, risers, cross pipes, headers and tubes containing only circumferentially welded butt joints, shall be nondestructively examined as required by Table 56.95-10 of this subchapter even though they may be exempted by the size limitations specified in PW-11.1.2 and PW-41.1 of the ASME Code.

§ 52.05-30 Minimum requirements for attachment welds (modifies PW-16).

(a) The location and minimum size of attachment welds for nozzles and other connections shall be as required by PW-16 of the ASME Code except as noted otherwise in this section.

(b) When nozzles or couplings are attached to boilers, as shown in Figure PW-16 (a) and (c) of the ASME Code and are welded from one side only, backing strips shall be used unless it can be determined visually or by acceptable nondestructive test methods that complete penetration has been obtained.

(c) When attachments as shown in Figure PW-16 (y) and (z) of the ASME Code are employed they shall be limited to 2-inch pipe size for pressure exceeding 150 pounds per square inch.

§ 52.05-35 Welded-in staybolts (modifies PW-19).

(a) Welded-in staybolts shall be as required by PW-19 of the ASME Code except as noted otherwise in this section.

(b) The palm end of the stay shall be not formed to the radius of curvature of the shell.

(c) Welded collars may be used in lieu of nuts to attach screw staybolts to plates, provided the legs of the welds are of sufficient length to develop a strength of at least 25 percent of the staybolt, but in no case shall the legs of the welds be less than one-fourth inch in length.

(d) The welding, except where welded collars are used, shall be stress-relieved in accordance with PW-39 of the ASME Code.

§ 52.05-40 Welded fabrication (modifies PW-26 through PW-43).

(a) Boilers and parts thereof fabricated by welding shall be as required by PW-26 through PW-43 of the ASME Code except as noted otherwise in this section, and in §§ 52.05-45 and 52.05-50.

(b) Welder qualification shall be as required by Part 57 of this subchapter.

(c) Welding procedure qualification shall be as required by Part 57 of this subchapter.

(d) Welder qualification records shall be maintained as required by Part 57 of this subchapter.

(e) The transferral of welder qualification shall be as permitted by Part 57 of this subchapter.

§ 52.05-45 Circumferential joints in pipes, tubes and headers (modifies PW-41).

(a) Circumferential welded joints of pipes, tubes and headers shall be as required by PW-41 of the ASME Code except as noted otherwise in this section.

(b) (Replaces PW-41.1.) Circumferential welded joints in pipes, tubes, and headers of pipe material shall be nondestructively tested as required by the table in § 56.95-10 of this subchapter in lieu of the requirement of PW-41.1 (PW-41.1.1—PW-41.1.4)

(c) (Modifies PW-41.5.) Butt welded connections shall be provided whenever radiography is required by Table 56.95-10 of this subchapter for the piping system in which the connection is to be made. When radiography is not required, welded socket or sleeve type joints meeting the requirements of PW-41.5 of the ASME Code may be provided. See also § 56.70-15(d)(3) of this subchapter.

[CGFR 68-82, 33 FR 18815, Dec. 18, 1968, as amended by CGD 73-254, 40 FR 40163, Sept. 2, 1975]

§ 52.05-50 Joints in boiler appurtenances (replaces PW-42).

(a) Welded boiler appurtenances, such as valves, water columns and separate external desuperheaters, shall be as required by Part 56 of this subchapter in lieu of PW-42 of the ASME Code.

§ 52.05-55 Inspection and tests of welded boilers (modifies PW-46 through PW-54).

(a) Inspection and tests of power boilers, boiler parts, and boiler internal piping that are fabricated by welding shall be as required by PW-46 through PW-54 of the ASME Code except as noted otherwise in this section.

(b) These inspections and tests shall be made and used in conjunction with the general requirements for inspections and tests in § 52.01-135.

(c) All welders and welding procedures employed in construction shall be qualified as required by Part 57 of this subchapter.

(d) Production test plates shall be made when required by Subpart 57.06 of this subchapter.

Subpart 52.10—Requirements for Boilers Fabricated by Riveting

§ 52.10-1 General (modifies PR-1 through PR-50).

(a) Boilers and component parts thereof that are fabricated by riveting shall be as indicated in PR-1 through PR-50 of the ASME Code except as noted otherwise in this subpart.

§ 52.10-3 Thickness of buttstraps (modifies PR-14).

(a) Buttstrap thickness shall be as indicated in PR-14 of the ASME Code except that the thickness of inner buttstraps shall exceed the thickness of outer buttstraps by 0.125 inches. However, this total thickness of inner and outer buttstraps is not required to exceed the thickness of the shell plate.

§ 52.10-5 Longitudinal riveted joints (replaces PR-16).

(a) The main power boilers and auxiliary boilers having longitudinal riveted joints of shells or drums shall be as indicated in this section in lieu of the requirements in PR-16 of the ASME Code.

(b) The longitudinal joints of drums and shells of all boilers shall be of riveted double-buttstrap construction, at least double-riveted.

(c) Where the drums of watertube boilers are pierced through the longitudinal buttstrap joint for the purpose of inserting tubes to connect the headers to the drum, the combined thickness of both buttstraps shall be taken in computing the efficiency of the ligament between tube holes. This efficiency shall in no case be less than that required for the riveted joint.

(d) Boiler shell plates having longitudinal joints shall be rolled or formed by pressure, not blows, to the proper curvature.

(e) The maximum allowable pitch of rivets in longitudinal joints shall be such as to insure good calking.

§ 52.10–10 Circumferential joints (modifies PR–17).

(a) Riveted circumferential joints shall be as indicated in PR–17 of the ASME Code except as noted otherwise in this section.

(b) Circumferential end joints of shell plates over ⅝-inch thick and circumferential joints connecting courses of shells, the required thickness of which is over one-half inch, shall be at least double-riveted. Where the thickness of the shell plate exceeds 1⅜ inches for single-ended boilers and $1\frac{3}{16}$ inches for double-ended boilers, the circumferential seams connecting shell courses shall be triple riveted.

§ 52.10–15 Riveted fabrication (modifies PR–30 through PR–40).

(a) The fabrication of riveted boilers and parts thereof shall be as indicated in PR–30 through PR–50 of the ASME Code except as noted otherwise in this section.

(b) The seal welding of rivet heads to secure tightness is prohibited.

(c) Plates and shapes shall be so closely fitted, metal to metal, as to require a minimum of calking to obtain tightness.

[CG FR 68-82, 33 FR 18815, Dec. 18, 1968, as amended by CGD 73-254, 40 FR 40163, Sept. 2, 1975]

Subpart 52.15—Requirements for Watertube Boilers

§ 52.15–1 General (modifies PWT–1 through PWT–15).

(a) Watertube boilers and parts thereof shall be as indicated in PWT–1 through PWT–15 of the ASME Code except as noted otherwise in this subpart.

(b) Superheaters fitted in conjunction with watertube boilers may be considered as a part of the boiler, provided the pipes between the boiler and superheater and between superheaters are made of seamless steel material having a minimum thickness computed by the formula specified for piping in Part 56 of this subchapter. Fittings used in making such connections shall be of forged or cast steel.

§ 52.15–5 Tube connections (modifies PWT–9 and PWT–11).

(a) Tubes, pipe and nipples shall be attached to sheets, heads, headers, and fittings as indicated in PWT–11 of the ASME Code except as noted otherwise in this section.

(b) (Replaces PWT–9.2 and PWT–11.3.) Threaded boiler tubes shall not be permitted as described by PWT–9.2 and PWT–11.3 of the ASME Code.

(c)(1) Boiler tubes may be welded to manifolds, headers, or drums without expanding or flaring provided the strength welds and testing comply with the provisions of this section.

(2) Economizer and water wall tubes not exceeding 2 inches in size may be attached to headers by means of socketwelded joints, provided the depth of the socket is the maximum allowable but in no case less than three-eighths and the diameter is not greater than one-sixty-fourth inch above that of the tube. The throat dimension of the fillet weld shall be at least 1¼ times the tube wall thickness and the weld shall be deposited with a minimum of two layers.

(3) Boiler tubes not exceeding 2 inches in size, may be attached to headers or drums by any of the acceptable types of groove welds as shown in Figure 52.15–5. The welding grooves shall be of such depth and form as to insure full penetration of the weld metal. The depth of the groove shall be at least 1¼ times the thickness of the tube, but in no case less than one-eighth inch in any direction. The welding procedure shall meet the requirements of Part 57 of this subchapter.

(4) Postweld heat treatment and radiography are not required except that welds joining materials other than P- or carbon-molybdenum (P-3) shall be examined by either the mag-

netic particle or the liquid penetrant method.

(d) In welded wall construction employing stub and welded wall panels which are field welded, approximately 10 percent of the field welds shall be checked using any acceptable nondestructive test method.

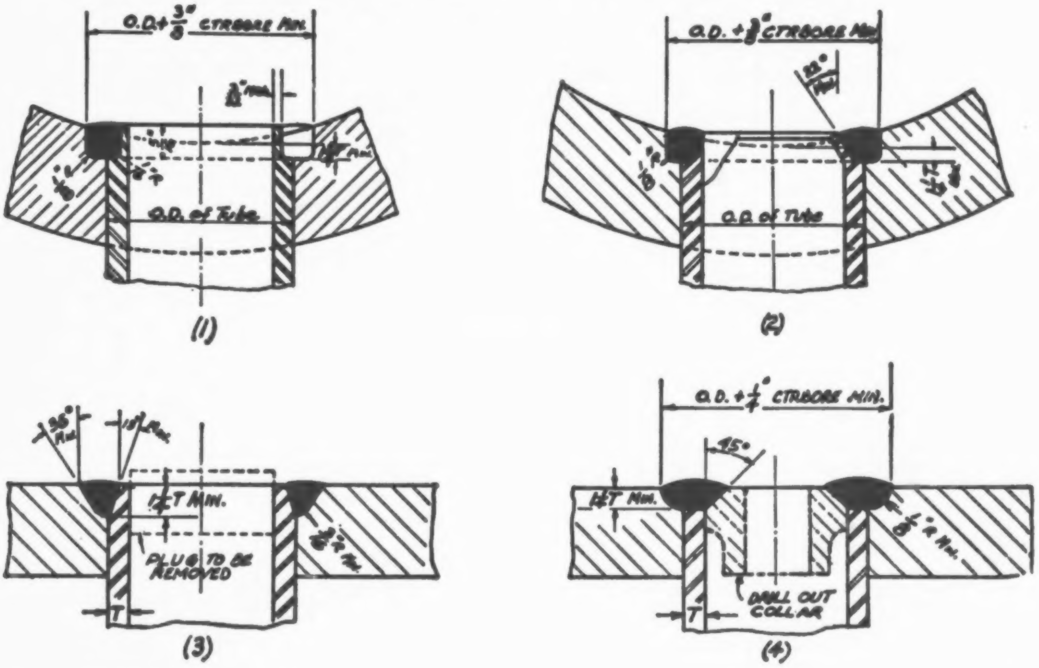


FIGURE 52.15-5—Acceptable types of welded attachments of boiler tubes to headers.

(e) Tubes may be lengthened or safe-ended by any of the methods described in PW-27 of the ASME Code.

(f) Nondestructive testing of the butt welded joints shall meet the requirements of Table 56.95-10 of this subchapter.

[CGFR 68-82, 33 FR 18815, Dec. 18, 1968, as amended by CGFR 69-127, 35 FR 9976, June 17, 1970]

Subpart 52.20—Requirements for Firetube Boilers

§ 52.20-1 General (modifies PFT-1 through PFT-49).

(a) Firetube boilers and parts thereof shall be as indicated in PFT-1 through PFT-49 of the ASME Code except as noted otherwise in this subpart.

§ 52.20-5 Shell joints (modifies PFT-10).

(a) Shell joints shall be as indicated in PFT-10 of the ASME Code except as noted otherwise in this section.

(b) The strength of riveted circumferential head joints of externally fired firetube or flue boilers exposed to the fire or to the products of combustion and having 50 percent or more of the total longitudinal force supported by the effect of tubes or stays shall meet the criteria of PR-17.1 of the ASME Code rather than the reduction permitted by PR-17.2 of the ASME Code. Joints not exposed to the fire or to the products of combustion may be designed to the criteria of PR-17.2 of the ASME Code.

§ 52.20-10 Combustion chambers and furnaces (modifies PFT-13 through PFT-21).

(a) *General.* Combustion chambers and furnaces shall be as indicated in PFT-13 through PFT-21 of the ASME

Code except as noted otherwise in this section.

(b) *Curved bottom plate without reinforcement.* (1) The maximum allowable working pressure and minimum thickness of curved bottoms of separate combustion chambers without reinforcement shall be computed by the following formulas:

$$P=(26/R)(300\,T-1.03L)$$

$$T=-[((PR/26)+1.03L)/300]$$

(c) *Curved bottom plate with reinforcement.* (1) When the bottoms of combustion chambers are reinforced by structural stiffeners, such as angle or T bars, the minimum thickness of such bars shall be equal to 80 percent of the thickness of the plate reinforced, and the depth of web shall be equal to at least one-half the pitch of the stiffeners. The maximum allowable working pressure and minimum thickness shall be computed by the following formulas:

$$P=(480T)^2/2RL$$

$$T=\sqrt{2RLP}/480$$

(2) The strength of the fastening of the stiffeners to the wrapper plate shall be adequate to prevent separation.

(d) *Symbols.* The symbols to be used in connection with the formulas in paragraphs (b) and (c) of this section are:

P=Maximum allowable working pressure, in pounds per square inch.

T=Thickness of plate, in inches.

R=External radius to which plate is formed, in inches.

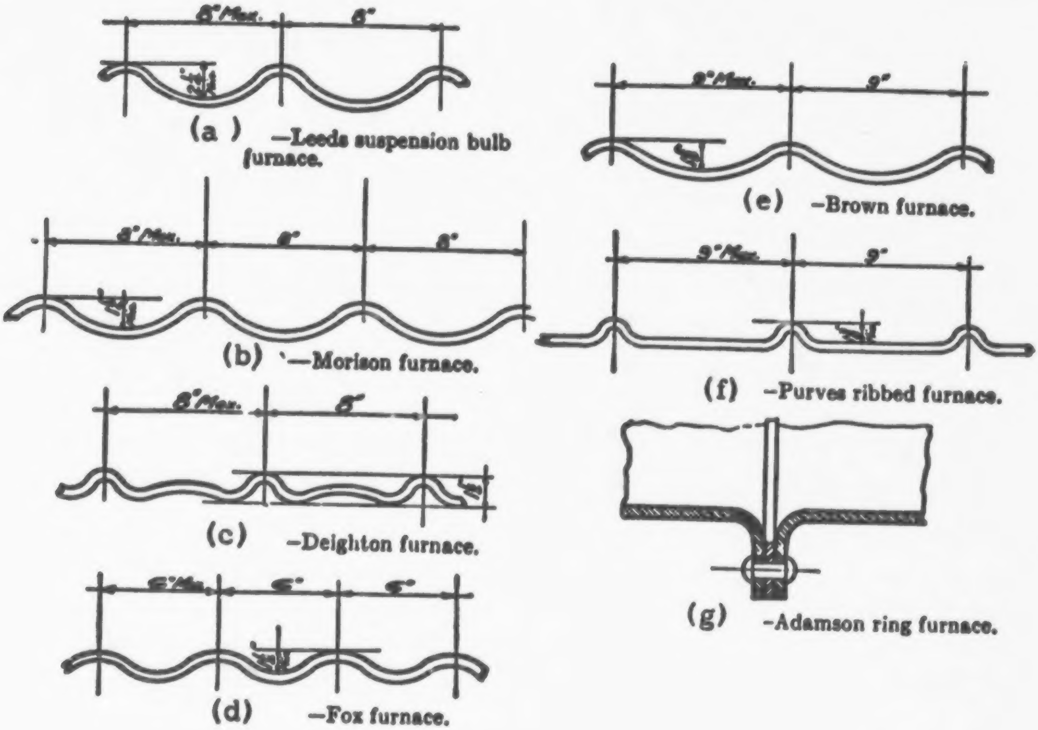
L=Length of plate between supports measured on a line parallel to the axis of the boiler, in inches.

(e) *Bottoms of common combustion chambers.* Curved bottoms of common combustion chambers shall be considered a flat surface and stayed in accordance with the requirements of PG–46 of the ASME Code.

(f) *Plates forming chamber and back connections.* When plates are flanged to form the combustion chamber and back connections, the minimum inner radius shall be not less than one and one-half times the thickness of the plate flanged.

(g) *Furnace corrugations.* The spacing and depth of furnace corrugations shall be in accordance with Figure 52.20–10.

(h) *Furnaces rolled in true circle.* New furnaces shall be rolled to practically a true circle. The maximum distortion permissible from the true circle shall not exceed one-fourth inch, and all new furnaces shall be measured by a marine inspector to ascertain that this tolerance has not been exceeded.



(a) —Leeds suspension bulb furnace.

(b) —Morison furnace.

(c) —Deighton furnace.

(d) —Fox furnace.

(e) —Brown furnace.

(f) —Purves ribbed furnace.

(g) —Adamson ring furnace.

FIGURE 52.20-10—Furnaces.

§ 52.20–15 Stayed surfaces (modifies PFT-22 through PFT-38).

(a) Stayed surfaces shall be as indicated in PFT-22 through PFT-38 of the ASME Code except as noted otherwise in this section.

(b) Riveted heads are not permissible on stays which are screwed into plates having a thickness of less than seven-sixteenths inch. Such stays shall be fitted with nuts or welded collars. See § 52.05-35. The minimum thickness of nuts used in connection with screw stays shall be one half the nominal diameter of the stay, but in no case less than three-quarters inch. The stays shall be so placed in relation to the joints that the plates can be caulked without removing the nuts.

(c) Where stay tubes are used for supporting flat surfaces they shall be fitted with threads at both ends, screwed into the tube sheets and rolled tight with expanders, in addition to which they may be beaded. Making such tubes tight by caulking is not permissible.

§ 52.20–17 Opening between boiler and safety valve (modifies PFT-44).

(a) When a discharge pipe is used, it must be installed in accordance with the requirements of Part 56 of this chapter.

[CGD 73-254, 40 FR 40163, Sept. 2, 1975]

§ 52.20–20 Domes (modifies PFT-45).

(a) Domes shall be as indicated in PFT-45 of the ASME Code except as noted otherwise in this section.

(b) The diameter of a dome shall not exceed one-half of the diameter of the boiler shell.

§ 52.20–25 Setting (modifies PFT-46).

(a) The method of supporting firetube boilers shall be as indicated in PFT-46 of the ASME Code except as noted otherwise in this section.

(b) The foundations shall meet the requirements of § 52.01-130.

Subpart 52.25—Other Boiler Types

§ 52.25-1 General.

(a) Requirements for fired boilers of various sizes and uses are referenced in Table 54.01-5(a) of this subchapter.

§ 52.25-5 Miniature boilers (replaces PMB-1 through PMB-21).

(a) The requirements in PMB-1 through PMB-21 of the ASME Code shall not apply to miniature boilers on board vessels. The applicable provisions in this part for the boiler type involved shall be followed.

§ 52.25-10 Organic fluid vaporizer generators (modifies PVG-1 through PVG-12).

(a) Organic fluid vaporizer generators and parts thereof shall meet the requirements of PVG-1 through PVG-12 except as noted otherwise in this section.

(b) The application and end use of organic fluid vaporizer generators shall be approved by the Commandant.

PART 53—HEATING BOILERS

Subpart 53.01—General Requirements

Sec.
53.01-1 Adoption of section IV of the ASME Code.
53.01-5 Scope (modifies HG-100).
53.01-10 Service restrictions and exceptions (replaces HG-101).

Subpart 53.05—Pressure Relieving Devices (Article 4)

53.05-1 Safety valve requirements for steam boilers (modifies HG-400 'and HG-401).
53.05-2 Relief valve requirements for hot water boilers (modifies HG-400.2 and HG-401.5).
53.05-5 Discharge capacities and valve markings (replaces HG-402).

Subpart 53.10—Tests, Inspection, Stamping, and Reporting (Article 5)

53.10-1 General.
53.10-3 Tests and shop inspections (modifies HG-500 through HG-540).
53.10-5 Exemptions.
53.10-10 Certification by stamping (modifies HG-530).
Sec.
53.10-15 Manufacturers' data report forms modifies (HG-520).

Subpart 53.12—Instruments, Fittings, and Controls

53.12-1 General (modifies HG-600 through HG-640).

Subpart 53.13—Welding and Brazing

53.13-1 Welding and brazing processes and qualifications (modifies HW-600 through HW-613 and HB-1500 through HB-1502).

Subpart 53.15—Plan Approval

53.15-1 Scope.
53.15-5 Exemptions.

AUTHORITY: R.S. 4405, as amended, 4462, as amended, sec. 633, 63 Stat. 545, sec. 6(b)(1), 80 Stat. 938; 46 U.S.C. 375, 416, 14 U.S.C. 633, 49 U.S.C. 1655(b); 49 CFR 1.4(a)(2), (f). R.S. 4417, as amended, 4417a, as amended, 4418, as amended, 4426-4431, as amended, 4433, as amended, 4434, as amended, 4491, as amended, sec. 14, 29 Stat. 690, as amended, sec. 10, 35 Stat. 428, as amended, 41 Stat. 305, as amended, secs. 1, 2, 49 Stat. 1544, 1545, as amended, sec. 17, 54 Stat. 166, as amended, sec. 3, 54 Stat. 347, as amended, sec. 3, 70 Stat. 152, sec. 3, 68 Stat. 675; 46 U.S.C. 391, 391a, 392, 404-409, 411, 412, 489, 366, 395, 363, 367, 526p, 1333, 390b, 50 U.S.C. 198; E.O. 11239, July 31, 1965, 30 FR 9671, 3 CFR, 1965 Supp., unless otherwise noted.

SOURCE: CGFR 68-82, 33 FR 18826, Dec. 18, 1968, unless otherwise noted.

Subpart 53.01—General Requirements

NOTE: See § 50.15-5 for general adoption of the ASME (American Society of Mechanical Engineers) Code. The adoption of section IV of the ASME Code, for heating boilers, is subject to specific limitations or modifications as described in this part. Those requirements in section IV of the ASME Code which are not referred to in this part are adopted without change. Table 53.01-1(a) sets forth a general reference to various paragraphs in section IV of the ASME Code which are limited, modified or replaced by regulations in this part.

§ 53.01-1 Adoption of section IV of the ASME Code.

(a) Heating boilers shall be designed, constructed, and inspected in accordance with section IV of the ASME (American Society of Mechanical Engineers) Code as limited, modified, or replaced by specific requirements in this part. The provisions in the appendices to section IV of the ASME Code are adopted and shall be followed when the requirements in section IV make them mandatory. For general information Table 53.01-1(a) lists the various paragraphs in section IV of the ASME Code which are limited, modified, or replaced by regulations in this part.

TABLE 53.01-1(a)—LIMITATIONS AND MODIFICATIONS IN THE ADOPTION OF SECTION IV OF THE ASME CODE

Paragraphs in section IV ASME code and disposition [1]	Unit of this part
HG-100 modified by	53.01-5(b).
HG-101 replaced by	53.01-10.
HG-400 modified by	53.05-1.
HG-400.2 modified by	53.05-2(b).
HG-401 modified by	53.05-1.
HG-401.5 modified by	53.05-2(c).
HG-402 replaced by	53.05-5.
HG-500 through HG-540 modified by	53.10-3.
HG-520 modified by	53.10-15.
HG-530 modified by	53.10-10.
HG-600 through HG-640 modified by	53.12-1.
HW-600 through HW-613 modified by	53.13-1(a).
HB-1500 through HB-1502 modified by	53.13-1(b)

[1] The references to specific provisions in the ASME Code are coded. The first letter "H" refers to section IV. The letter following "H" refers to a part or subpart in section IV. The number following the letters refers to the paragraph so numbered in the text of the part or subpart in section IV.

(1) As stated in § 50.15-5 of this subchapter, section IV of the ASME Code is adopted and shall be the governing requirements for heating boilers unless specifically limited, modified, or replaced by other regulations in this part.

(b) References to the ASME Code, such as paragraph HG-307, indicate:

H=Section IV, Heating Boilers, ASME Code.
G=Part containing general requirements.
3=Article in part.
307=Paragraph within Article 3.

(c) When a paragraph or a section of the regulations in this part relates to material in section IV of the ASME Code, the relationship with the code will be shown immediately following the heading of the section or at the beginning of the paragraph as follows:

(1) (Modifies H———.) This indicates that the material in H——— is generally applicable but is being altered, amplified or augmented.

(2) (Replaces H———.) This indicates that H——— does not apply.

(3) (Reproduces H———.) This indicates that H——— is being identically reproduced for convenience, not for emphasis.

(Sec. 552, 80 Stat. 383, as amended: 5 U.S.C. 552)

[CGFR 68-82, 33 FR 18826, Dec. 18, 1968, as amended by CGFR 69-127, 35 FR 9976, June 17, 1970]

§ 53.01-5 Scope (modifies HG-100).

(a) The regulations in this part apply to steam heating boilers, hot water boilers (which include hot water heating boilers and hot water supply boilers), and to appurtenances thereto. The requirements in this part shall be used in conjunction with section IV of the ASME Code Table 54.01-5(a) of this subchapter gives a breakdown by parts in this subchapter of the regulations governing various types of pressure vessels and boilers.

(b) (Modifies HG-100.) The requirements of Part HG of section IV, Heating Boilers, of the ASME Code shall be used except as noted otherwise in this part.

(c) Cast iron boilers for steam above 15 pounds per square inch pressure or for water above 30 pounds per square inch pressure or 250° F. shall not be accepted.

§ 53.01-10 Service restrictions and exceptions (replaces HG-101).

(a) *General.* The service restrictions and exceptions shall be as indicated in this section in lieu of the requirements in HG-101 of the ASME Code.

(b) *Service restrictions.* (1) Boilers of wrought materials shall be restricted to a maximum of 30 pounds per square inch gage pressure for steam and a maximum of 100 pounds per square inch gage pressure or 250° F. for hot water. If operating conditions exceed these limits, design and fabrication shall be in accordance with Part 52 of this subchapter.

(2) Boilers of cast iron materials shall be restricted to a maximum of 15 pounds per square inch gage pressure for steam and to a maximum of 30

pounds per square inch gage pressure or 250° F. for hot water. If either of these limits is exceeded, a cast iron boiler shall not be accepted.

(c) *Hot water supply boilers.* (1) Those electrically fired hot water supply boilers which have a capacity not greater than 120 gallons, a heat input not greater than 58.6 kilowatts (200,000 B.t.u. per hour), and are listed as approved under Underwriters' Laboratories Standard 174 are exempted from the requirements of this part provided they are protected by a pressure relief device. This relief device need not comply with § 53.05-2.

(2) Oil fired hot water supply boilers shall not be exempted from the requirements of this part on the basis of size or heat input.

(d) *Controls and miscellaneous accessories.* Refer to Part 63 of this subchapter for the requirements governing controls and miscellaneous accessories.

Subpart 53.05—Pressure Relieving Devices (Article 4)

§ 53.05-1 Safety valve requirements for steam boilers (modifies HG-400 and HG-401).

(a) The pressure relief valve requirements and the safety valve requirements for steam boilers shall be as indicated in HG-400 and HG-401 except as noted otherwise in this section.

(b) Each steam boiler shall have at least one safety valve.

(c) Design and construction of valves shall comply with Subpart 162.012 of Subchapter Q (Specifications) of this chapter.

§ 53.05-2 Relief valve requirements for hot water boilers (modifies HG-400.2 and HG-401.5).

(a) The relief valve requirements for hot water boilers shall be as indicated in article 4 of section IV of the ASME Code except as noted otherwise in this section.

(b) (Modifies HG-400.2.) Each hot water boiler (heating and supply) shall have at least one safety-relief valve.

(c) (Modifies HG-401.5.) Design and construction of valves shall comply with Subpart 162.013 of Subchapter Q (Specifications) of this chapter.

§ 53.05-5 Discharge capacities and valve markings (replaces HG-402).

(a) The discharge capacities and valve markings shall be as indicated in this section in lieu of the requirements in HG-402 of the ASME Code.

(b) Marking of relief devices and flowtesting of valves for actual capacity shall conform to Subpart 162.012 or 162.013, as appropriate, of Subchapter Q (Specifications) of this chapter.

Subpart 53.10—Tests, Inspection, Stamping, and Reporting (Article 5)

§ 53.10-1 General.

(a) The tests, inspection, stamping, and reporting of heating boilers shall be as indicated in Article 5, Part HG of section IV of the ASME Code except as noted otherwise in this subpart.

§ 53.10-3 Tests and shop inspections (modifies HG-500 through HG-540).

(a) A marine inspector will make a shop inspection and witness the required pressure test on boilers regulated under this part except as noted in § 53.10-5. (See HG-510 and HC-410 of the ASME Code.)

(b) Automatically controlled boilers shall be subjected to such operating tests as prescribed in Part 63 of this subchapter regardless of the type of stamp they have and regardless of whether or not Coast Guard shop inspection of the bare boiler was made.

(c) All heating boilers, regardless of exemptions, shall have the operation of their pressure relieving devices checked after final installation.

[CGFR 68-82, 33 FR 18826, Dec. 18, 1968, as amended by CGD 73-254, 40 FR 40163, Sept. 2, 1975]

§ 53.10-5 Exemptions.

(a) Heating boilers, which are constructed and stamped in accordance with section I of the ASME Code, need not have a Coast Guard shop inspection nor a Coast Guard stamping. (See

§§ 52.01-135 and 52.01-140 of this subchapter.)

(b) Heating boilers, which are constructed and stamped in accordance with section IV of the ASME Code, need not have a Coast Guard shop inspection nor a Coast Guard stamping provided they are made of:

(1) Wrought materials and limited to use with steam not exceeding 15 pounds per square inch gage or with hot water at 100 pounds per square inch or below; or,

(2) Cast iron and limited to use with steam not exceeding 15 pounds per square inch gage or with hot water at 30 pounds per square inch gage or below.

§ 53.10-10 Certification by stamping (modifies HG-530).

(a) Stamping of heating boilers shall be as indicated in HG-530 of the ASME Code except as noted otherwise in this section.

(b) Heating boilers exempted by § 53.10-5, which are constructed in accordance with applicable provisions in section I or section IV of the ASME Code, shall receive the full ASME stamping, including the appropriate code symbol.

(c) Upon satisfactory completion of the tests and Coast Guard inspection, heating boilers not exempted by § 53.10-5 shall be stamped or marked in a place that is readily visible with the following:

(1) Manufacturer's name and serial number.

(2) Coast Guard number, see § 50.10-30 of this subchapter.

(3) Coast Guard symbol, which is affixed only by the marine inspector.

(4) ——— Maximum allowable working pressure—steam at———°F.

(5) ——— Maximum allowable working pressure—hot water at———°F.

(6) ——— Heating surface (sq. ft.)

(7) ——— Minimum safety valve or relief valve relieving capacity in pounds or B.T.U. per hour as determined according to HG—400.1(d) or HG—400.2(d) of the ASME Code.

[CGFR 68-82, 33 FR 18826, Dec. 18. 1968, as amended by CGFR 69-127, 35 FR 9976, June 17, 1970]

§ 53.10-15 Manufacturers' data report forms (modifies HG-520).

(a) The Manufacturers' data report form, as provided by the Coast Guard, shall be completed in duplicate and certified by the manufacturer for each heating boiler required to be shop inspected under these regulations. The original of this form shall be delivered to the Coast Guard inspector.

(b) Data forms for those parts of a heating boiler requiring inspection, which are furnished by other than the shop of the manufacturer responsible for the completed unit, shall be executed in triplicate by the manufacturer of the parts. The original and one copy shall be delivered to the Coast Guard inspector who shall forward one copy of the report to the Officer in Charge, Marine Inspection having cognizance over the final assembly. These partial data reports, together with the final inspection and tests, shall be the final Coast Guard inspectors' authority to apply the Coast Guard symbol and number. A final data report shall be executed by the manufacturer or assembler who completes the final assembly and tests.

[CGFR 69-127, 35 FR 9976, June 17, 1970]

Subpart 53.12—Instruments, Fittings, and Controls

§ 53.12-1 General (modifies HG-600 through HG-640).

(a) The instruments, fittings and controls for heating boilers shall be as indicated in HG-600 through HG-640 of section IV of the ASME Code except as noted otherwise in this section.

(b) For control systems for automatic auxiliary heating equipment, the requirements in Part 63 of this subchapter govern and shall be followed.

Subpart 53.13—Welding and Brazing

§ 53.13-1 Welding and brazing processes and qualifications (modifies HW-600 through HW-613 and HB-1500 through HB-1502).

(a) Heating boilers and their appurtenances not exempted from Coast

Guard inspection by § 53.10-5, fabricated by welding or brazing, shall be as required by HW-600 through HW-613 or HB-1500 through HB-1502 of the ASME Code and Part 57 of this subchapter.

(b) Heating boilers and their appurtenances exempted by § 53.10-5 and fabricated by welding or brazing shall be as required by HW-600 through HW-613 or HB-1500 through HB-1502 of the ASME Code.

Subpart 53.15—Plan Approval

§ 53.15-1 Scope.

(a) Manufacturers intending to fabricate boilers to be installed on vessels shall have the plans and calculations for design and construction of heating boilers submitted for approval in accordance with Subpart 50.20 of this subchapter unless otherwise noted in this subpart.

(b) Plans for boiler controls are not covered in this subpart. See Part 63 of this subchapter for applicable requirements.

§ 53.15-5 Exemptions.

(a) (Refer to § 53.10-5.) Plans need not be submitted to the Coast Guard for approval for:

(1) Heating boilers which are constructed and stamped under section I of the ASME Code; and,

(2) Heating boilers which are constructed and stamped under section IV of the ASME Code.

PART 54—PRESSURE VESSELS

Subpart 54.01—General Requirements

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54.01-1 Adoption of division 1 of section VIII of the ASME Code.
54.01-2 Adoption of TEMA Standards for heat exchangers.
54.01-3 Adoption of other standards and specifications.
54.01-5 Scope (modifies U-1 and U-2).
54.01-10 Steam generating pressure vessels (modifies U-1(e)).
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54.01-16 Mobile offshore drilling units: pressure vessels for industrial systems.
Sec.
54.01-17 Pressure vessel for human occupancy (PVHO).
54.01-18 Plan approval.
54.01-25 Miscellaneous pressure components (modifies UG-11).
54.01-30 Loadings (modifies UG-22).
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54.01-40 External pressure (modifies UG-28).

Subpart 54.03—Low Temperature Operation

54.03-1 Scope.
54.03-5 General.

Subpart 54.05—Toughness Tests.

54.05-1 Scope (replaces UG-84).
54.05-3 Tests required.
54.05-5 Toughness test specimens.
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54.05-10 Certification of material toughness tests.
54.05-15 Weldment toughness tests—procedure qualifications.
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54.05-30 Allowable stress values at low temperatures.

Subpart 54.10—Inspection, Reports, and Stamping

54.10-1 Scope (modifies UG-90 through UG-103 and UG-115 through UG-120).
54.10-3 Marine inspectors (replaces UG-90 and UG-91, and modifies UG-92 through UG-103).
54.10-5 Maximum allowable working pressure (reproduces UG-98).
54.10-10 Standard hydrostatic test (modifies UG-99).
54.10-15 Pneumatic test (modifies UG-100).
54.10-17 Certification by stamping.
54.10-20 Marking and stamping.
54.10-25 Manufacturers' data report forms (modifies UG-120).

Subpart 54.15—Pressure-Relief Devices

54.15-1 General (modifies UG-125 through UG-134).
54.15-3 Definitions (modifies UA-60).
54.15-5 Protective devices (modifies UG-125).
54.15-10 Safety and relief valves (modifies UG-126).
54.15-13 Rupture disks (modifies UG-127).
54.15-15 Relief devices for unfired steam boilers, evaporators, and heat exchangers (modifies UG-126).

Sec.
54.15-25 Minimum relief capacities for cargo tanks containing compressed or liquefied gas.

Subpart 54.20—Fabrication by Welding

54.20-1 Scope (modifies UW-1 through UW-65).
54.20-2 Fabrication for dangerous substances (replaces UW-2(a)).
54.20-3 Design (modifies UW-9, UW-11(a), UW-13, and UW-16).
54.20-5 Welding qualification tests and production testing (modifies UW-26, UW-28, UW-29, UW-47, and UW-48).
54.20-10 Spot-examination of welded joints (replaces UW-52(c)(3)).

Subpart 54.23—Fabrication by Brazing

54.23-1 Scope (modifies UB-1).

Subpart 54.25—Construction With Carbon, Alloy, and Heat Treated Steels

54.25-1 Scope.
54.25-3 Steel plates (modifies UCS-6).
54.25-5 Corrosion allowance (replaces UCS-25).
54.25-7 Requirements for postweld heat treatment (modifies UCS-56).
54.25-8 Requirements for radiography (modifies UW-11(a) and UCS- 57).
54.25-10 Low temperature operation—ferritic steels (replaces UCS-65 through UCS-67).
54.25-15 Low temperature operation—high alloy steels (modifies UHA-23(b) and UHA-51).
54.25-20 Low temperature operation—ferritic steels with properties enhanced by heat treatment (modifies UHT-5(c), UHT-6, UHT-23, and UHT-82).
54.25-25 Welding of quenched and tempered steels (modifies UHT-82).

Subpart 54.30—Mechanical Stress Relief

54.30-1 Scope.
54.30-3. Introduction.
54.30-5 Limitations and requirements.
54.30-10 Method of performing mechanical stress relief.
54.30-15 Requirement for analysis and computation.

AUTHORITY: R.S. 4405, as amended, 4462, as amended, sec. 633, 63 Stat. 545, sec. 6(b)(1), 80 Stat. 938; 46 U.S.C. 375, 416, 14 U.S.C. 633, 49 U.S.C. 1655(b); 49 CFR 1.4(a)(2), (f). Interpret or apply R.S. 4417, as amended, 4417a, as amended, 4418, as amended, 4426-4431, as amended, 4433, as amended, 4434, as amended, 4491, as amended, sec. 14, 29 Stat. 690, as amended, sec. 10, 35 Stat. 428, as amended, 41 Stat. 305, as amended, secs. 1, 2, 49 Stat. 1544, 1545, as amended, sec. 17, 54 Stat. 166 as amended, sec. 3, 54 Stat. 347, as amended, sec. 3, 70 Stat. 152, sec. 3, 68 Stat. 675; 46 U.S.C. 391, 391a, 392, 404-409, 411, 412, 489, 366, 395, 363, 367, 526p, 1333, 390b, 50 U.S.C. 198; E.O. 11239, July 31, 1965, 30 FR 9671, 3 CFR, 1965 Supp., unless otherwise noted.

SOURCE: CGFR 68-82, 33 FR 18828, Dec. 18, 1968, unless otherwise noted.

Subpart 54.01—General Requirements

NOTE: (1) See § 50.15-5 for general adoption of the ASME (American Society of Mechanical Engineers) Code. The adoption of division 1 of section VIII of the ASME Code for pressure vessels is subject to specific limitation or modifications as described in this part. Those requirements in division 1 of section VIII of the ASME Code which are not referred to in this part are adopted without change. Table 54.01-1(a) sets forth a general reference to various paragraphs in division 1 of section VIII of the ASME Code which are limited, modified, or replaced by regulations in this part. Division 2 of section VIII of the ASME Code is not adopted.

(2) See § 50.15-20 for general adoption of selected standards issued by Tubular Exchanger Manufacturer's Association (TEMA) for heat exchangers which are limited, modified or replaced by regulations in this part.

§ 54.01-1 Adoption of division 1 of section VIII of the ASME Code.

(a) Pressure vessels shall be designed, constructed, and inspected in accordance with division 1 of section VIII of the ASME (American Society of Mechanical Engineers) Code, as limited, modified, or replaced by specific requirements in this part. The provisions in the appendices to division 1 of section VIII of the ASME Code are adopted and shall be followed when the requirements in section VIII make them mandatory. For general information Table 54.01-1(a) lists the various paragraphs in division 1 of section VIII of the ASME Code which are limited, modified, or replaced by regulations in this part. Other divisions of section VIII of the ASME Code have not been adopted.

(1) As stated in § 50.15-5 of this subchapter, division 1 of section VIII of the ASME Code is adopted and shall be the governing requirements for pressure vessels unless specifically lim-

ited, modified or replaced by other regulations in this part.

TABLE 54.01-1(a)—LIMITATIONS AND MODIFICATIONS IN THE ADOPTION OF DIVISION 1 OF SECTION VIII, ASME CODE

Paragraphs in Section VIII, ASME Code [1] and disposition	Unit of this part
U-1 and U-2 modified by	54.01-5 through 54.01-16.
U-1(c) replaced by	54.01-5.
U-1(d) replaced by	54.01-5(a) and 54.01-15.
U-1(e) modified by	54.01-10.
U-1(h) replaced by	54.01-15.
UG-11 modified by	54.01-25.
UG-22 modified by	54.01-30.
UG-25 modified by	54.01-35.
UG-28 modified by	54.01-40.
UG-84 replaced by	54.05-1.
UG-90 through UG-103 modified by.	54.10-1.
UG-90 and UG-91 replaced by	54.10-3.
UG-92 through UG-103 modified by.	54.10-3.
UG-98 reproduced by	54.10-5.
UG-99 modified by	54.10-10.
UG-100 modified by	54.10-15.
UG-115 through UG-120 modified by.	54.10-1.
UG-116, except (k) replaced by	54.10-20(a).
UG-116(k) replaced by	54.10-20(b).
UG-117 replaced by	54.10-20(c).
UG-118 replaced by	54.10-20(a).
UG-119 modified by	54.10-20(d).
UG-120 modified by	54.10-25.
UG-125 through UG-134 modified by.	54.15-1 through 54.15-15.
UG-125 modified by	54.15-5.
UG-125 modified by	54.15-10, 54.15-15.
UG-127 modified by	54.15-13.
UW-1 through UW-65 modified by.	54.20-1.
UW-2(a) replaced by	54.01-5(b) and 54.20-2.
UW-2(b) replaced by	54.01-5(b).
UW-9, UW-11(a), UW-13, UW-16 modified by.	54.20-3.
UW-11(a) modified by	54.25-8.
UW-26, UW-27, UW-29, UW-47, UW-48 modified by.	54.20-5.
UW-52(c)(3) replaced by	54.20-10.
UB-1 modified by	54.23-1
UB-2 modified by	52.01-95(d) and 56.30-30(b)(1).
USC-6 modified by	54.25-3.
UCS-25 replaced by	54.25-5.
USC-56 modified by	54.25-7.
USC-57 modified by	54.25-8.
USC-65 through UCS-67 replaced by.	54.25-10.
UHA-23(b) and UHA-51 modified by.	54.25-15.
UHT-5(c), UHT-6, UHT-23 modified by.	54.25-20.
UHT-82 modified by	54.25-20, 54.25-25.
UA-60 modified by	54.15-3.

[1] The references to specific provisions in the ASME Code are coded. The first letter "U" refers to division 1 of section VIII. The second letter, such as "G", refers to a subsection within section VIII. The number refers to the paragraph within the subsection.

(b) References to the ASME Code, such as paragraph UG-125, indicate:

U=Division 1 of section VIII, Pressure Vessels, ASME Code.
G=Part containing general requirements.
125=Paragraph within part.

(c) When a paragraph or a section of the regulations in this part relates to material in division 1 of section VIII of the ASME Code, the relationship with the code will be shown immediately following the heading of the section or at the beginning of the paragraph as follows:

(1) (Modifies U———.) This indicates that the material in U——— is generally applicable but is being altered, amplified or augmented.

(2) (Replaces U———.) This indicates that U——— does not apply.

(3) (Reproduces U———.) This indicates that U——— is being identically reproduced for convenience, not for emphasis.

(Sec. 552, 80 Stat. 383, as amended; 5 U.S.C. 552)

[CGFR 68-82, 33 FR 18828, Dec. 18, 1968, as amended by CGFR 69-127, 35 FR 9976, June 17, 1970; CGFR 72-59R, 37 FR 6188, Mar. 25, 1972; CGD 72-206R, 38 FR 17226, June 29, 1973; CGD 73-254, 40 FR 40163, Sept. 2, 1975]

§ 54.01-2 Adoption of TEMA Standards for heat exchangers.

(a) Heat exchangers (all portions other than the basic pressure vessel shell and heads) shall be designed, constructed and inspected in accordance with the TEMA (Tubular Exchanger Manufacturers Association) Standards for Class "B", "C", or "R" heat exchangers, as limited, modified, or replaced by specific requirements in this subchapter. The TEMA Standards require that the individual vessel shall comply with the requirements of division 1 of section VIII of the ASME Code for the pressure vessel shell portion, and may, in turn, be limited or replaced by regulations in this part.

(b) The TEMA Standards for heat exchangers cover tubes, shells and shell covers, baffle and support plates, floating heads, gaskets, tube sheets, channels and channel covers, nozzles and end flanges, and bolting. In event there is a conflict between a requirement in the TEMA Standards for heat exchangers and division 1 of section VIII of the ASME Code, then the provisions in the ASME Code shall govern and shall be followed. In event there is a difference of requirements between the TEMA Standards for heat exchangers and the regulations in this subchapter, the requirements in the regulations in this subchapter shall govern and shall be followed.

(Sec. 552, 80 Stat. 383, as amended; 5 U.S.C. 552)

§ 54.01-3 Adoption of other standards and specifications.

(a) *General.* As stated in Subpart 50.15 of this subchapter, the standards and specifications specifically referred to in this part shall be the governing requirements for the subject matters covered unless specifically limited, modified or replaced by other regulations in this subchapter.

(b) *American Society of Testing Materials* (ASTM). The specifications of the American Society of Testing Materials referenced in this part are adopted and form a part of this subchapter.

(c) *Compressed Gas Association (CGA).* The standards of the Compressed Gas Association (see § 50.15-20(a) of this subchapter) referenced in this part are adopted and form a part of this subchapter.

(d) *Manufacturers' Standardization Society of the Valve and Fittings Industry (MSS).* The standards of the Manufacturers' Standardization Society (see § 50.15-20(a) of this subchapter) referenced in this part are adopted and form a part of this subchapter.

(Sec. 552, 80 Stat. 383, as amended; 5 U.S.C. 552)

§ 54.01-5 Scooe (modifies U-1 and U-2).

(a) (Replaces U-1(d)(1).) The regulations in this part apply to pressure vessels. The requirements in this part shall be used in conjunction with division 1 of section VIII, Pressure Vessels, of the ASME Code. Table 54.01-5(a) gives a breakdown by parts in this subchapter of the regulations governing various types of pressure vessels and boilers.

(b) Welded pressure vessels are divided into Classes I, I-L (low temperatures), II, II-L (low temperatures), and III, depending on service of vessel, contents carried in the pressure vessel, or pressures and/or temperatures of contents carried. Table 54.01-5(b) describes the classes of welded pressure vessels and requirements other than for special heat exchanger requirements which are noted in § 54.01-2.

(c) (Modifies U-1(c)). It is intended that jurisdiction of this part over piping external to a pressure vessel shall terminate at the:

(1) First circumferential joint for welding end connections;

(2) Face of the first flange in bolted flanged connections; or

(3) First threaded joint in that type connection.

(d) Pressure vessels containing dangerous articles, substances or combustible liquids which are required by law or regulation to be carried in containers fabricated as a pressure vessel shall comply with the applicable requirements for materials, construction, welding, inspection and marking as specified in this chapter irrespective of pressure, temperature or capacity. However, dangerous articles, substances or combustible liquids may be carried in containers constructed in accordance with the requirements of the Department of Transportation and where so permitted by Part 146 in Subchapter N (Dangerous Cargoes) of this chapter.

(e) In a multichambered pressure vessel, each chamber may be classed differently. Where an interface between two chambers exists, the pressure difference across it shall be, for purposes of design and testing, the greater of the following:

(1) Maximum allowable working pressure (gage) in the higher pressure chamber.

(2) Maximum allowable working pressure (absolute) in the higher pressure chamber minus the least operating pressure (absolute) in the vacuum chamber.

(f) The requirements for the design, fabrication, inspection and certification or stamping of pressure vessels, other than those covered by Parts 52, 53, and 55 of this subchapter, shall be as required in division 1 of section VIII of the ASME Code except as noted otherwise in this part.

TABLE 54.01–5(a)—REGULATION REFERENCE FOR BOILERS, PRESSURE VESSELS, AND THERMAL UNITS

Service	Pressure temperature boundaries	Part of this subchapter regulating mechanical design	Part of this subchapter regulating automatic control
Main (power) boiler	All	52	
Pressure vessel	All	54	NA
Fired auxiliary boiler (oil or electricity):			
(a) Steam	More than 30 p.s.i.g.	52	63
	Equal to or less than 40 p.s.i.g.	53	63
(b) Hot water heating	More than 100 p.s.i.g. or 250° F	52	63
	Equal to or less than 100 p.s.i.g. and 250° F	53	63
(c) Hot water supply	More than 100 p.s.i.g. or 250° F	52	63
	Equal to or less than 100 p.s.i.g. and 250° F	53	63
Other:			
(a) Fired thermal fluid heaters	All	52	63
(b) Unfired steam boiler [1]	More than 30 p.s.i.g. or 850° F [2]	52	NA
	Equal to or less than 30 p.s.i.g. and 850° F [2]	54	NA
(c) Evaporators and heat exchangers	More than 15 p.s.i.g.[3]	54	NA
(d) Unfired hot water supply or heating boiler	More than 15 p.s.i.g.[3]	54	NA

[1] Including exhaust gas types.

[2] Temperature of working fluid.

[3] Relief device is required even if designed for less than 15 p.s.i.g.

§ 54.01-10 Steam generating pressure vessels (modifies U-1(e)).

(a) Pressure vessels in which steam is generated, such as waste heat boilers and steam generators in the secondary system of a nuclear plant, be classed as "Unfired Steam Boilers" except as required otherwise by paragraph (b) of this section. The unfired steam boilers shall be fitted with an efficient water level indicator, a pressure gage, and a blowdown valve. An approved safety valve shall be fitted as required by § 54.15-15. Unfired steam boilers, including exhaust gas types, shall be constructed in accordance with this part other than when the pressures are more than 30 pounds per square inch or the temperatures of the working fluid are more than 850° F. when such boilers shall be constructed in accordance with Part 52 of this subchapter.

(b) Vessels known as "Evaporators" or "Heat Exchangers" are not classified as unfired steam boilers. They shall be fitted with an approved safety device as required under § 54.15-15 and constructed in accordance with this part.

(c) An evaporator in which steam is generated shall be fitted with an efficient water level indicator, a pressure gage, and a blowdown valve.

§ 54.01-15 Exemptions from shop inspection and plan approval (replaces U-1(d) and U-1(h)).

(a) The following classifications are exempt from shop inspection and plan approval requirements of this part:

(1) Vessels containing water at a pressure not greater than 100 pounds per square inch gage, nor a temperature above 200° F., including those containing air, the compression of which serves only as a cushion. Air charging lines may be permanently attached provided the air pressure does not exceed 15 pounds per square inch gage.

(2) Hot water supply storage tanks heated by steam or any other indirect means when none of the following limitations is exceeded:

(i) A heat input of 200,000 B.t.u. per hour;

(ii) A water temperature of 200° F.;

(iii) A nominal water-containing capacity of 120 gallons; or

(iv) A pressure of 100 pounds per square inch gage.

The exemption of any tank under this subparagraph requires that it shall be fitted with a safety relief valve of at least 1-inch diameter, set to relieve below the maximum allowable working pressure of the tank.

(3)(i) Vessels having an internal operating pressure not exceeding 15 pounds per square inch gage with no limitation on size. (See UG-28(e) of the ASME Code.)

(ii) Cargo tanks of pressure vessel configuration are not included in the exemption in subdivision (i) of this subparagraph.

(4) Class II and III (See Table 54.01-5 (b)) vessels which have qualified and been stamped U or UM under section VIII of the ASME Code and which have an internal volume of less than 5 cubic feet.

(5) Condensers and heat exchangers, regardless of size, where the design is such that the liquid phase is not greater than 100 pounds per square inch gage and 200° F. and the vapor phase is not greater than 15 pounds per square inch gage provided system over pressure conditions are considered.

(b) For fluid conditioner fittings see § 56.15-1 of this subchapter.

[CGFR 68-82, 33 FR 18828, Dec. 18, 1968, as amended by CGFR 69-127, 35 FR 9977, June 17, 1970; CGFR 70-143, 35 FR 19906, Dec. 30, 1970]

§ 54.01-16 Mobile offshore drilling units: pressure vessels for industrial systems.

(a) A Class I, II, or III pressure vessel which is a component in an industrial system under Subpart 58.60 of this chapter is accepted by the Coast Guard for installation on a mobile offshore drilling unit if it meets the requirement of Table 54.01-5(b) in full, or if it—

(1) is stamped "U" under Section VIII of the ASME Code;

(2) meets the postweld heat treatment and the minimum joint and radiographic requirements of Table 54.01-5(b); and

(3) has pressure-relief devices that meet Subpart 54.15 of this chapter.

(b) Class I-L and II-L pressure vessels must meet the requirements of Table 54.01-5(b) in full and are not accepted under § 154.01-16.

(Sec. 2, 87 Stat. 418 (46 U.S.C. 86); sec. 3, 82 Stat. 341, as amended (46 U.S.C. 367); R.S. 4405, as amended (46 U.S.C. 375); sec. 10, 35 Stat. 428 (46 U.S.C. 395); R.S. 4423, as amended (46 U.S.C. 400); R.S. 4429, as amended (46 U.S.C. 407); R.S. 4430, as amended (46 U.S.C. 408); 88 Stat. 423 (46 U.S.C. 411); R.S. 4434, as amended (46 U.S.C. 412); R.S. 4462, as amended (46 U.S.C. 416); sec. 1, 73 Stat. 475 (46 U.S.C. 481); sec. 4, 67 Stat. 462 (43 U.S.C. 1333(d)); sec. 6(b)(1), 80 Stat. 937 (49 U.S.C. 1655(b)(1)); 49 CFR 1.46 (b) and (n)(6))

[CGD 73-251, 43 FR 56799, Dec. 4, 1978]

§ 54.01-17 Pressure vessel for human occupancy (PVHO).

Pressure vessels for human occupancy (PVHO's) must meet the requirements of Subpart B (Commercial Diving Operations) of Part 197 of this chapter.

(46 U.S.C. 239, 390b, 391a; 33 U.S.C. 1509(b); 43 U.S.C. 1333(d)(1); 43 U.S.C. 1331 et seq., as amended by Sec. 203 and 208 of Pub. L. 95-372; 46 U.S.C. 395, 375, 391, 392, 416; 49 U.S.C. 1655(b); 49 CFR 1.46 (b) and (s))

[CGD 76-009, 43 FR 53683, Nov. 16, 1978]

§ 54.01-18 Plan approval.

(a) Manufacturers intending to fabricate pressure vessels, heat exchangers, evaporators, and similar appurtenances, covered by the regulations in this part shall submit detailed plans in accordance with Subpart 50.20 of this subchapter.

(b) The following information shall be submitted:

(1) Calculations for all pressure containment components including the maximum allowable working pressure, the hydrostatic or pneumatic test pressure, and the intended safety device setting.

(2) Joint design and methods of attachment of all pressure containment components.

(3) Foundations and supports (design and attachment).

(4) Pertinent calculations for pressure vessel foundations and/or supports.

(5) A bill of material meeting the requirements of section VIII of the ASME Code, as modified by this part.

(6) A diagrammatic arrangement drawing of the assembled unit indicating location of internal and external components.

§ 54.01-25 Miscellaneous pressure components (modifies UG-11).

(a) Pressure components for pressure vessels shall be as required by UG-11 of the ASME Code except as noted otherwise in this section.

(b) All pressure components conforming to an accepted ANSI (American National Standards Institute) Standard referred to in an adopted code, specification or standard or in this subchapter shall also be marked in accordance with MSS (Manufacturers' Standardization Society) Standard SP-25.

[CGFR 68-82, 33 FR 18828, Dec. 18, 1968, as amended by CGFR 69-127, 35 FR 9977, June 17, 1970]

§ 54.01-30 Loadings (modifies UG-22).

(a) The loadings for pressure vessels shall be as required by UG-22 of the ASME Code except as noted otherwise in this section.

(b) In evaluating loadings for certain pressure vessel applications, the Commandant may require consideration of the following loads in addition to those listed in UG-22 of the ASME Code:

(1) Loading imposed by vessel's attitude in roll, list, pitch and trim.

(2) Dynamic forces due to ship motions.

§ 54.01-35 Corrosion (modifies UG- 25).

(a) Vessels or portions of vessels subject to corrosion shall be as required by UG-25 of the ASME Code except as noted otherwise in this section.

(b) The pressure portions of pressure vessels shall:

(1) Normally have a corrosion allowance of one-sixth of the calculated thickness, or one-sixteenth inch, whichever is smaller, added to the cal-

culated thickness as determined by the applicable design formula.

(2) Be specifically evaluated in cases where unusually corrosive cargoes will be involved, for the possible increase of this corrosion allowance.

(3) Have no additional thickness required when acceptable corrosion resistant materials are used.

(4) Not normally need additional thickness allowance when the effective stress (either S or SE depending on the design formula used) is 80 percent or less of the allowable stress listed in section VIII of the ASME Code for calculating thickness.

(c) Telltale holes shall not be permitted in pressure vessels containing dangerous fluids, such as acid, poison, corrosives, etc.

(d) Exemption from these corrosion allowance requirements will be granted by the Commandant in those cases where:

(1) The contents of the pressure vessel is judged to be sufficiently noncorrosive; and,

(2) Where the external surface is also protected from corrosion. A suitable vapor barrier is adequate protection, while paint or other thin coatings exposed to weather or mechanical damage are not acceptable.

NOTE: No applied linings except as provided in Part UCL of the ASME Code shall be acceptable.

[CGFR 68-82, 33 FR 18828, Dec. 18, 1968, as amended by CGFR 72-59R, 37 FR 6189, Mar. 25, 1972]

§ 54.01-40 External pressure (modifies UG-28).

(a) The exemption from external pressure consideration provided by the note under UG-28(f) does not apply.

(b) Vessels which may at times be subjected to partial vacuum due to nature of the contents, temperature, unloading operations, or other facet of employment shall either have vacuum breaker protection or be designed for not less than one-half atmosphere of external pressure.

[CGFR 70-143, 35 FR 19906, Dec. 30, 1970]

Subpart 54.03—Low Temperature Operation

§ 54.03-1 Scope.

(a) The pressure vessels for low temperature operation shall be as required by section VIII of the ASME Code as modified by this subpart.

§ 54.03-5 General.

(a) Requirements for ferritic steels, high alloy steels, and heat treated ferritic steels are contained in §§ 54.25-10, 54.25-15, and 54.25-20 respectively of this subchapter.

(b) Requirements for toughness testing of material product forms and weldments (including weld procedure qualification and production toughness tests) are contained in Subpart 54.05.

(c) Materials suitable for a given minimum service temperature may be used in warmer service. Steels differing in chemical composition, mechanical properties, or heat treatments from those specified may be specially approved by the Commandant. Similarly, aluminum alloys and other nonferrous materials not intended to be covered by these sections may be specially considered by the Commandant for service at any low temperature.

[CGFR 68-82, 33 FR 18828, Dec. 18, 1968, as amended by CGFR 69-127, 35 FR 9977, June 17, 1970]

Subpart 54.05—Toughness Tests

§ 54.05-1 Scope (replaces UG-84).

(a) The toughness tests of materials used in pressure vessels shall be as required by this subpart in lieu of requirements in UG-84 of the ASME Code.

§ 54.05-3 Tests required.

(a) Where material or welding toughness tests are required by §§ 54.25-10, 54.25-15, 54.25-20, and Subpart 57.03 or 57.06 of this subchapter, the following requirements shall apply:

(1) Additional requirements for ferritic steels with properties enhanced by heat treatment are in § 54.25-20.

(2) Certified reports of toughness tests by the material manufacturer will be acceptable evidence provided the specimens taken are representative of the material delivered and that the material is not subject to treatment during or following fabrication that will reduce its impact properties. If such treatment is subsequently applied to the material, test specimens shall be so taken and treated as to be representative of the material in the finished vessel.

(b) The requirements of this subpart are also applicable to nonpressure vessel type low temperature tanks and associated secondary barriers, as defined in § 38.05–4 of Subchapter D (Tank Vessels) of this chapter.

[CGFR 68–82, 33 FR 18828, Dec. 18, 1968, as amended by CGFR 69–127, 35 FR 9977, June 17, 1970]

§ 54.05–5 Toughness test specimens.

(a) *Charpy V-notch impact tests.* Where required, Charpy V-notch tests shall be conducted in accordance with ASTM Specification E–23, "Notched Bar Impact Testing of Metallic Materials", using the Type A specimen shown in Figure 4 of the specification. Special attention is drawn to the fact that the Charpy Keyhole and U-notch specimens are not acceptable substitutes for the Charpy V-notch specimen and shall not be used to qualify materials within the scope of this subpart. Each set of Charpy impact tests shall consist of three specimens. For materials ½-inch thick or less, the largest possible Charpy specimens for that thickness shall be cut centered at the material's mid-thickness. For materials thicker than ½-inch, full size Charpy specimens shall be cut centered at a location as near as practicable to a point midway between the material's surface and half-thickness. Except where otherwise specified, transversely oriented specimens must be used. When longitudinal specimens are used, the required energy values may not be less than 1.5 times the values required for transversely oriented specimens. In all cases the notch shall be cut normal to the material's surface. Test specimens shall be taken at least one "t" from any heat treated edge (where "t" is the material's nominal thickness).

(b) *Drop weight tests.* Where required, drop weight tests shall be conducted for no-break performance in accordance with ASTM Specification E–208, "Conducting Drop-Weight Test to Determine Nil-Ductility Transition Temperature of Ferritic Steels". For material thicknesses between ½-inch and ⅝-inch, the ASTM E–208 specimen P–3, machined to ½-inch thickness, shall be used with a stop distance of 0.090-inch. In preparing weld specimens for dropweight testing, weld reinforcement shall be ground flush, the hard facing bead centered on and transverse to the weld, and the notch centered on and parallel to the weld axis.

(c) *Retest procedures.* (1) When Charpy V-notch impact specimens are used and the average value of the three initial specimens fails to meet the stated requirements by an amount not exceeding 15 percent, or the value for more than one specimen is below the required average value of when the value for one specimen is below the minimum value permitted for a single specimen by an amount not exceeding 15 percent, three additional specimens from the same material may be tested and the results combined with those previously obtained to form a new average. This new average of six specimens must exceed the specified minimum average. In the event the Charpy retests fail, the material may still be qualified by exhibiting a no-break performance when tested in accordance with the drop weight procedure, if applicable. Two drop weight specimens shall be tested for each Charpy V-notch set of three initial specimens which failed to qualify. Failure of either or both of these drop weight specimens will constitute rejection of the material or weldments represented, except as outlined in paragraph (3) of this section (c).

(2) When drop weight specimens are used, retests shall be permitted only within the limits prescribed in ASTM Specification E–208, except as outlined in paragraph (3) of this section (c).

(3) If, for heat treated base material, the required toughness results are not obtained in the initial test or in the

retest, the material may be reheat treated one time and tested again in accordance with the initial requirements for the material.

(d) *Alternate toughness tests.* The Charpy V-notch impact values of §§ 54.05–20(a) and 54.05–25(a) are representative of those which correlate with the nil-ductility transition temperature determined by the drop-weight tests for the steels specified in § 54.25–10. For materials for which there are other data showing suitable correlation between Charpy V-notch and drop-weight tests, V-notch acceptance limits different from those tabulated herein may be specially approved by the Commandant, based upon the actual correlation. In the case of steels for which the tabulated Charpy V-notch values can be shown to be inapplicable or in the case of specially considered steels, or as an alternative to complying with the tabulated impact requirements, acceptance may be based upon the material exhibiting a no-break performance when tested in accordance with the drop-weight procedure. Whenever the drop-weight test is used as an alternative to the Charpy V-notch test, two drop-weight specimens shall be tested for each set of three Charpy V-notch specimens otherwise required. If the drop-weight test cannot be performed because of material thickness limitations (less than one-half inch) or product shape, or is otherwise inapplicable (because of heat treatment, chemistry, etc.), other tests and/or test criteria will be specified by the Commandant to assure the adequacy of the material for the intended application.

[CG FR 68–82, 33 FR 18828, Dec. 18, 1968, as amended by CGD 73–254, 40 FR 40163, Sept. 2, 1975]

§ 54.05–6 Toughness test temperature.

(a) Toughness tests shall be conducted at temperatures not warmer than 10° F. below the minimum service temperature, except that for service at or below—320° F., such tests may be conducted at the service temperature. Service temperature is defined in § 54.25–10(a)(2).

§ 54.05–10 Certification of material toughness tests.

(a) *Plate material.* The manufacturer of plates may certify such material, provided it has been given an appropriate heat-treatment, by reporting the results of tests of one set of Charpy impact specimens or of two drop weight specimens, as applicable, taken from each plate as rolled. Impact specimens shall be taken as outlined in section 4(b) of ASTM A-300. The long axis of the Charpy specimen must be perpendicular to the final direction of rolling. When the direction of maximum stress is unknown, the manufacturer may certify on the basis of specimens taken parallel to the final direction of rolling.

(b) *Pipe or tube material.* (1) The manufacturer of pipe, tube, or welded fittings formed from pipe or tube may certify such material by reporting the results of tests of one set of Charpy impact specimens, provided the requirement for production in this paragraph (b)(1) or paragraph (b)(2) of this section, as well as the requirement for sampling in paragraph (b)(3) of this section are met. The specimens shall have the major axis parallel to the length of pipe or tube. In the case of welding fittings, the specimens may be taken from the tubing prior to forming provided the fittings are normalized after forming. Such specimens shall be normalized before testing.

(2) One set of specimens may represent each five (5) short tons, or less, of the pipe, tubes, or welding fittings produced from one heat of steel poured from a single melting furnace charge and subsequently processed in the same manner, provided all are given a normalizing heat-treatment in a continuous treating furnace in which the temperature is automatically controlled and checked by recording pyrometer.

(3) One set of specimens may represent each five (5) short tons, or less, of the pipe, tubes, or welding fittings that have been given a normalizing heat-treatment as a single charge in a batch-treating furnace equipped with recording pyrometer provided all have been produced from a single melting furnace heat and are subsequently

processed in the same manner. If more than one melting furnace heat is present in the batch heat-treating furnace, means of identification shall be provided and one set of specimens shall be taken from each heat.

(4) One set of impact specimens shall be taken from one pipe or tube picked at random from each heat or furnace batch or portion thereof to be certified.

(c) *Forgings and forged or rolled fittings.* (1) The manufacturer of forgings for any purpose may certify them by reporting the results of tests of one set of Charpy impact specimens or two drop-weight specimens, as applicable, taken from each 5 short tons of product from each melting heat provided the requirements in this paragraph for production and sampling are met.

(2) One or more test blocks shall be cut from billets or blooms selected at random from each heat of material. Each test block shall be forge-reduced in thickness to the thickness of the finished forgings to be certified, within the limitations set below. After forging to the reduced thickness, the test block shall be heat-treated in the same manner as the finished forgings represented, which heat-treatment of test blocks may be carried out in the furnace with the forgings, or separately. If carried out separately, both heat-treatments shall be done in automatically controlled furnaces equipped with calibrated recording pyrometers, the certified records of which shall be made available to the inspector.

(3) One set of Charpy impact specimens or two drop-weight specimens, as applicable, shall be cut from each such test block and these specimens shall represent all forgings (up to 5 short tons) that are from the same heat of material and given the same heat-treatment as the test block, and the thickness of which does not differ from that of the test block by more than plus or minus 50 percent of 1½ inches, whichever is less, except that forged flanges and tube sheets thicker than 5½ inches may be qualified from a 4-inch test block.

(4) As many test blocks shall be made as are required under the foregoing rule in paragraph (3) of this section (c)(4) to cover the weight of product and range of thickness found in the forgings represented. The major axis of the test specimens shall be parallel to the length of the test block.

(d) *Bars and shapes, rolled or forged.* (1) The manufacturer of forged or rolled bars and shapes may certify such by reporting the results of one set of Charpy impact specimens, or two drop-weight specimens, as applicable, produced from each 5 short tons from a single melting furnace heat, processed in a similar manner and heat-treated as a single furnace batch, if heat-treated. The impact specimens shall be cut from the heaviest section, clear of fillets, of the shape being tested with the axis of the specimens parallel to the axis of the bar or shape.

(e) *Castings.* (1) The manufacturer of castings may certify them by reporting the results of one set of Charpy impact specimens or two drop-weight specimens, as applicable, taken from each 5 short tons of product from each melting furnace heat. These specimens shall be taken either directly from a production casting or from test coupons cast attached thereto provided the additional requirements in this paragraph are met.

(2) One set of Charpy impact or two drop-weight specimens may represent all castings (up to 5 short tons) that are from the same heat of material and that have a thickness that does not differ from the thickness of the section from which the specimens were taken by more than plus or minus 25 percent, or 1½ inches, whichever is less. A wider range of thicknesses from one heat may be covered by taking additional sets of specimens from thicker or thinner material as may be required.

(3) The test specimens shall be heat-treated in the same manner as the castings represented, which heat-treatment of specimens may be carried out in the furnace with the castings represented, or separately, but if carried out separately both heat-treatments shall be done in automatically controlled furnaces equipped with calibrated recording pyrometers, the certified records of which shall be made available to the marine inspector.

TABLE 54.01-5(b)—WELDED PRESSURE VESSEL CLASSIFICATION

[Special heat exchanger requirements excluded, see § 54.01-2]

	Class Service contents	Class limits on pressure and temperature	Minimum joint requirements[1]	Minimum radiography requirements, section VIII, ASME Code	Post weld heat treatment required[5]	Shop inspection required	Plan approval required
I	(a) Vapor or gas (b) Liquid (c) Dangerous substances[2].	Over 600 p.s.i. or 700° F. Over 600 p.s.i. or 400° F.	(1) for category A. (1) or (2) for category B. All categories C and D shall be full penetration welds extending through the entire thickness of the vessel wall or nozzle wall.	Full on all butt joints regardless of thickness. Exceptions listed in Table UCS-57 of ASME Code do not apply.	For carbon or low alloy steel, as per Table UCS-56, regardless of thickness. For other materials, as per section VIII, ASME Code.	Yes	Yes.
I-L (low temperature)	(a) Vapor or gas (b) Liquid (c) Dangerous substances[2].	Over 250 p.s.i. and service temperature below 0° F. Over 250 p.s.i. and service temperature below 0° F.	(1) for categories A and B. All categories C and D shall be full penetration welds extending through the entire thickness of the vessel wall or nozzle wall. No backing rings or strips left in place.	Full on all butt joints regardless of thickness. Exceptions listed in Table UCS-57 of ASME Code do not apply.	For carbon or low alloy steel, as per Table UCS-56, regardless of thickness. For other materials, as per section VIII, ASME Code.	Yes	Yes.
II	(a) Vapor or gas (b) Liquid (c) Dangerous substances[2].	30 through 600 p.s.i. or 275° through 700° F. 200 through 600 p.s.i. or 250° through 400° F.	(1) or (2) for category A. (1), (2) or (3) for category B. Categories C and D as per UW-16 of ASME Code.	Spot, unless exempted by UW-11(c) of ASME Code.	As per section, VIII of ASME Code.	Yes[4]	Yes[4]
II-L (low temperature).	(a) Vapor or gas (b) Liquid (c) Dangerous substances[2].	0 through 250 p.s.i. and service temperature below 0° F. 0 through 250 p.s.i. and service temperature below 0° F.	(1) for category A. (1) or (2) for category B. Category C: Full penetration extending through section at joint, Category D: Full penetration extending through thickness of vessel or nozzle.	Spot. Not exempted by UW-11(c) of ASME Code.	Same as for I-L except that mechanical relief may be substituted where permitted under Subpart 54.30.	Yes	Yes.
III	(a) Vapor or gas (b) Liquid (c) Dangerous substances[3].	Under 30 p.s.i. and 0° through 275° F. Under 200 p.s.i. and 0° through 250° F.	As per section VIII of ASME Code.	Spot, unless exempted by UW-11(c) of ASME Code.	As per section VIII of ASME Code.	Yes[4]	Yes.[4]

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[1] Welded joint categories are defined under UW-3 of the ASME Code Joint types are described in Table UW-12 of the ASME Code, and numbered "(1)," "(2)," etc.

[2] See § 54.20-2(a).

[3] See § 54.20-2(b).

[4] Refer to §§ 54.01-15 and 54.10-3 for exemptions.

[5] Specific requirements modifying Table UCS-56 of the ASME Code are found in § 54.25-7.

[CGFR 68-82, 33 FR 18828, Dec. 18, 1968, as amended by CGFR 69-127, 35 FR 9976, June 17, 1970; CGFR 72-59, 37 FR 6189, Mar. 25, 1972; CGD 72-206R, 38 FR 17226, June 29, 1973]

(f) *Small parts.* The manufacturer of small parts, either cast or forged, may certify a lot of not more than 20 duplicate parts or 5 short tons, whichever is less, by reporting the results of one set of Charpy impact specimens, or two drop-weight specimens, as applicable, taken from one such part selected at random, provided the same kind of material and the same process of production were used for all of the lot. When the part is too small to provide the specimens of at least minimum size, no impact test need be made. For such parts too small to impact test, toughness qualifications shall be determined by the Commandant based on material, chemical, and mechanical properties.

[CGFR 68-82, 33 FR 18828, Dec. 18, 1968, as amended by CFR 73-254, 40 FR 40164, Sept. 2, 1975]

§ 54.05-15 Weldment toughness tests—procedure qualification.

(a) Plate for which Charpy V-notch impact testing is required in the parent material and for which V-notch minima are specified shall similarly have welding procedures qualified for toughness by Charpy V-notch testing. For these tests, the test plates shall be oriented with their final rolling direction parallel to the weld axis (i.e., so that transverse impact specimens result), and with the V-notch normal to the plate surface. The sample weld joint preparation shall be the same as that used in production. The number of test specimens and the location of their notches shall be as shown in Figure 54.05-15(a) and as described in paragraphs (1) through (5) of this section.

(1) Three specimens with the notch centered in the weld metal.

(2) Three specimens with the notch centered on the fusion line between parent plate and weld. (The fusion line may be identified by etching the specimen with a mild reagent.)

(3) Three specimens with the notch centered in the heat affected zone, 1 mm from the fusion line.

(4) Same as paragraph (3) of this section (a)5 but 3 mm from the fusion line.

(5) Same as paragraph (3) of this section (a)5, but 5 mm from the fusion line.

(b) Plate materials for which Charpy V-notch minimums are not specified, or for which a Charpy V-notch correlation with NDT is not known, and which are themselves tested for toughness by the drop-weight procedure, shall have welding procedures similarly qualified by the drop-weight test. For such qualifications, two drop-weight specimens are to be tested, with the notch positioned directly above and parallel to the centerline of the weld.

(c) Piping welding toughness tests shall be qualified, by making Charpy V-notch impact tests as prescribed in paragraph (a) of this section.

(d) Materials which are specially approved based on toughness criteria or tests, other than those discussed in paragraphs (a) and (b) of this section, shall have welding procedures tested and qualified for toughness as deemed appropriate and necessary by the Commandant.

(e) In the case of stainless steels, weld procedure toughness tests may be limited to weld metal only if this is all that is required by § 54.25-15.

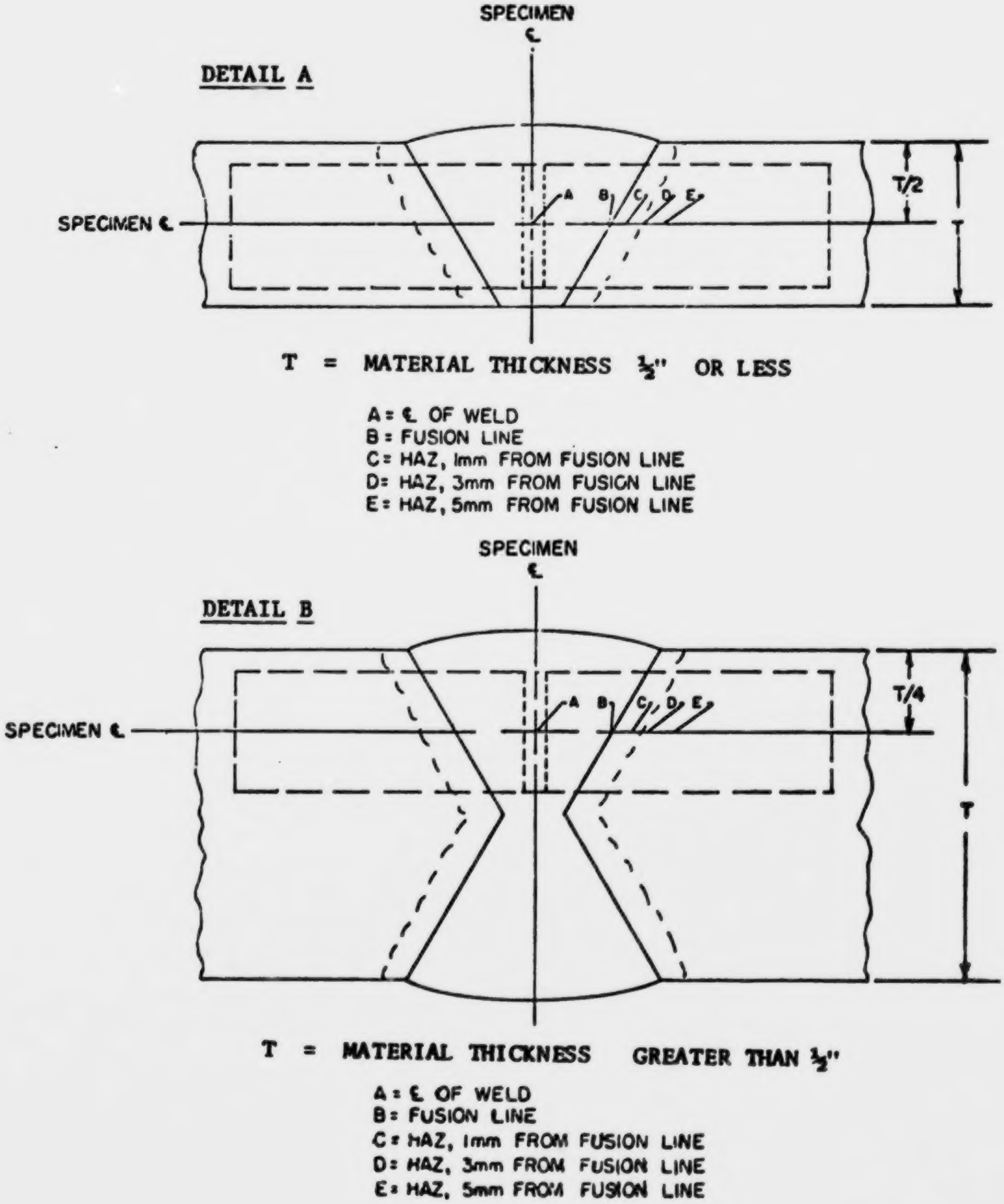
SPECIMEN ℄
DETAIL A
SPECIMEN ℄
A
B
C
D
E
T/2
T
T = MATERIAL THICKNESS ½" OR LESS
A = ℄ OF WELD
B = FUSION LINE
C = HAZ, 1mm FROM FUSION LINE
D = HAZ, 3mm FROM FUSION LINE
E = HAZ, 5mm FROM FUSION LINE
SPECIMEN ℄
DETAIL B
SPECIMEN ℄
A
B
C
D
E
T/4
T
T = MATERIAL THICKNESS GREATER THAN ½"
A = ℄ OF WELD
B = FUSION LINE
C = HAZ, 1mm FROM FUSION LINE
D = HAZ, 3mm FROM FUSION LINE
E = HAZ, 5mm FROM FUSION LINE

FIGURE 54.05-15(a)—Charpy V-notch specimen removal details.

§ 54.05-16 Production toughness testing.

(a) For vessels of welded construction, production toughness test plates shall be prepared for each 50 feet of longitudinal and circumferential butt weld in each Class I-L vessel, or for each 150 feet in each Class II-L vessel, except for material other than stainless steel that is exempted from impact test requirements by this subchapter. In the case of stainless steels, weld production toughness tests may be limited to weld metal only if this is all that is required be § 54.25-15. The test-plate thickness shall be the same as that of the vessel wall at the location of the production weld being sampled. The test plates shall be prepared, wherever possible, as run-off tabs attached at the ends of weld butts or seams. The rolling direction of the run-off tabs should be oriented parallel to the rolling direction of the adjacent production material. The test-plate material shall be taken from one of the heats of material used in the vessel, and both the electrodes and welding procedures shall be the same as used in the fabrication of the vessel. From each test plate, one set of three Charpy impact bars or two drop-weight specimens, as applicable according to the test used in procedure qualification, shall be taken transverse to the weld axis. For Charpy V-notch specimens, the notch shall be normal to the material surface and its location alternated (approximately) on successive tests between the weld metal and heat affected zone. Thus, approximately half of all weld production impact tests will be of weld metal and half of heat affected zone material. For the weld metal tests, the V-notch is to be centered between the fusion lines. For the heat affected zone tests, the notch is to be centered so as to sample, as nearly as practicable, the most critical location for toughness observed in the weld procedure qualification tests. Where the drop weight specimen is used in production weld testing, it shall be prepared in the same manner as specified for procedure qualification testing, § 54.05-15(b).

(b) For vessels not exceeding 5 cubic feet in volume, one set of impact specimens, or two drop-weight specimens, as applicable according to the test used in procedure qualification, may represent all vessels from the same heat of material not in excess of 100 vessels, or one heat-treatment furnace batch. In addition, when such vessels are welded, one weld test plate made from one of the heats of material used, and two sets of impact specimens or two drop-weight specimens, as applicable, cut therefrom, may represent the weld metal in the smallest of: One lot of 100 vessels or less; or each heat-treatment furnace batch; or each 50 feet of welding for Class I-L vessels; or each 150 feet of welding for Class II-L vessels.

(c) For several vessels or parts of vessels being welded in succession, the plate thickness of which does not vary by more than one-fourth inch, and which are made of the same grade of material, a test plate shall be furnished for each 50 feet of welding for Class I-L vessels or 150 feet of welding for Class II-L vessels. For each 50- or 150-foot increment of weld, as applicable, the test plates shall be prepared at the time of fabrication of the first vessel involving that increment.

(d) The test plates and any other test material from which toughness test specimens are cut shall be given the same heat-treatment as the production material they represent. Test specimens representing other material than the weld toughness test plates shall preferably be cut from a part of the vessel material but may be cut from like material that has been heat-treated within the temperature range specified by the producer in treating the actual vessel material.

(e) For nonpressure vessel type tanks and associated secondary barriers, as defined in § 38.05-4, Subchapter D (Tank Vessels) of this chapter, production toughness test plates shall be prepared in accordance with paragraphs (a) and (d) of this section. One set of toughness test plates shall be prepared for each 165 feet (50 meters) of production butt type welds.

§ 54.05-17 Weld toughness test acceptance criteria.

(a) For Charpy V-notch impact tests the energy absorbed in both the weld metal and heat affected zone impact tests in weld qualification and production shall be:

(1) For weld metal specimens, not less than the transverse values required for the parent material.

(2) For heat affected zone specimens, when the specimens are transversely oriented, not less than the transverse values required for the parent material.

(3) For heat affected zone specimens, when the specimens are longitudinally oriented, not less than 1.5 times the transverse values required for the parent material.

(b) For drop-weight tests both specimens from each required set shall exhibit a no-break performance.

[CGFR 68-82, 33 FR 18828, Dec. 18, 1968, as amended by CGD 73-254, 40 FR 40164, Sept. 2, 1975]

§ 54.05-20 Impact test properties for service of 0° F and below.

(a) *Test energy.* The impact energies of each set of transverse Charpy specimens may not be less than the values shown in Table 54.05-20(a). Only one specimen in a set may be below the required average and the value of that specimen must be above the minimum impact value permitted on one specimen only. See § 54.05-5(c) for retest requirements.

TABLE 54.05-20(a).—*Charpy v-notch impact requirements*

Size of specimen	Minimum impact value required for average of each set of 3 specimens foot-pounds [1]	Miminum impact value permitted on one specimen only of a set, foot-pounds
10 × 10 mm	20.0	13.5
10 × 7.5 mm	16.5	11.0
10 × 5 mm	13.5	9.0
10 × 2.5 mm	10.0	6.5

[1] Straight line interpolation for intermediate values is permitted.

(b) Transversely oriented Charpy V-notch impact specimens of ASTM A-203 nickel steels must exhibit energies not less than the values shown in § 54.05-20 (a). Requirements for 9 percent nickel steels are contained in § 54.25-20. Other nickel alloy steels, when specially approved by the Commandant, must exhibit a no-break performance when tested in accordance with the drop weight procedure. If, for such materials, there are data indicating suitable correlation with drop-weight tests, Charpy V-notch tests may be specially considered by the Commandant in lieu of drop-weight tests. If the drop-weight test cannot be performed because of material thickness limitations (less than one-half inch), or product shape, or is otherwise inapplicable (because of heat treatment, chemistry etc.) other tests or test criteria will be specified by the Commandant.

(c) Where sufficient data are available to warrant such waiver, the Commandant may waive the requirements for toughness testing austenitic stainless steel materials. Where required, austenitic stainless steels are to be tested using the drop-weight procedure and must exhibit a no-break performance. Where data are available indicating suitable correlation of Charpy V-notch results with drop-weight NDT or no-break performance, Charpy V-notch tests may be specially considered by the Commandant in lieu of dropweight tests. If the dropweight test cannot be performed because of material thickness limitations (less than one-half inch), or product shape, or is otherwise inapplicable (because of heat treatment, chemistry, etc.) other tests and/or test criteria will be specified by the Commandant.

[CGD 73-254, 40 FR 40164, Sept. 2, 1975]

§ 54.05-25 [Reserved]

§ 54.05-30 Allowable stress values at low temperatures.

(a) The Coast Guard will give consideration to the enhanced yield and tensile strength properties of ferrous and nonferrous materials at low temperature for the purpose of establishing allowable stress values for service temperature below 0° F.

(b) The use of such allowable stress values must be specially approved by the Coast Guard for each application. Further information may be obtained by writing to the Coast Guard (G-MMT).

(c) Submittals must include information and calculations specified by the Coast Guard (G-MMT) to demonstrate that the allowable stress for the material cannot be exceeded under any possible combination of vessel loads and metal temperature.

(46 U.S.C. 375, 392, 406, 407, 416; 49 U.S.C. 1655(b); 49 CFR 1.4(b) and 1.46(b))

[CGD 73-133R, 39 FR 9179, Mar. 8, 1974]

Subpart 54.10—Inspection, Reports, and Stamping

§ 54.10-1 Scope (modifies UG-90 through UG-103 and UG-115 through UG-120).

(a) The inspection, tests, stamping, and reports for pressure vessels shall be as required by paragraphs UG-90 through UG-103 and UG-115 through UG-120 of the ASME Code except as noted otherwise in this subpart.

§ 54.10-3 Marine inspectors (replaces UG-90 and UG-91, and modifies UG-92 through UG-103).

(a) Only marine inspectors shall apply the Coast Guard Symbol. They will not apply any other code symbol to pressure vessels.

(b) All pressure vessels not exempted under provisions of § 54.01-15 shall be inspected by a marine inspector referring to procedures outlined in UG-92 through UG-103 of the ASME Code and §§ 50.30-10, 50.30-15, and 50.30-20 of this subchapter. However, the Officer in Charge, Marine Inspection, may accept shop inspection by authorized ASME Code Inspectors as defined in UG-91 of the ASME Code for Class III pressure vessels in cases where he is satisfied that any special Coast Guard requirements have been met. The marine inspector will then stamp the vessel with the Coast Guard Symbol.

§ 54.10-5 Maximum allowable working pressure (reproduces UG-98).

(a) The maximum allowable working pressure for a vessel is the maximum pressure permissable at the top of the vessel in its normal operating position at the operating temperature specified for that pressure. It is the least of the values found for maximum allowable working pressure for any of the essential parts of the vessel by the principles given in paragraph (b) of this section and adjusted for any difference in static head that may exist between the part considered and the top of the vessel. (See UA-60 (a) of the ASME Code.)

(b) The maximum allowable working pressure for a vessel part is the maximum internal or external pressure, including the static head thereon, as determined by the rules and formulas in this Division (ASME Code), together with the effect of any combination of loadings listed in UG-22 of the ASME Code (see § 54.01-30) which are likely to occur, for the designated coincident operating temperature, excluding any metal thickness specified as corrosion allowance. (See UG-25 of the ASME Code.)

(c) Maximum allowable working pressure may be determined for more than one designated operating temperature, using for each temperature the applicable allowable stress value.

NOTE: Table 54.10-5 gives pictorially the interrelation among the various pressure levels pertinent to this part of the regulations. It includes reference to section VIII of the ASME Code for definitions and explanations.

TABLE 54.10–5—PICTORIAL INTER -RELATION AMONG VARIOUS PRESSURE LEVELS WITH REFERENCES TO SPECIFIC REQUIREMENTS[1]

Pressure differential, psi[2]	Test pressures[3]	Relief device pressure settings	Pressures upon which relief device flow capacity is based.
Increasing ↑	Burst proof test (UG–101(m) of ASME Code).		
	Yield proof test (UG–101(j) of ASME Code).		
	Standard hydrostatic test (UG–99 of ASME Code).		
	Pneumatic test (UG–100 of ASME Code).		Fire exposure, 120% MAWP.
		Rupture disk burst (§ 54.15–13)	
			Normal, 110% MAWP.
	Maximum allowable working pressure (MAWP), UG–98 and UA–60(a) of ASME Code.	Maximum allowable working pressure (MAWP), UG–98 and UA–60(a) of ASME Code.	Maximum allowable working pressure (MAWP), UG–98 and UA–60(a) of ASME Code.
	Design pressure, UG–21, and UA–60(b) of ASME Code.	Design pressure, UG–21 and UA–60(b) of ASME Code.	Design pressure, UG–21 and UA–60(b) of ASME Code.
		Safety or relief value setting (UG–133 of ASME Code).	
	Operating pressure (UA–60(f) of ASME Code).	Operating pressure (UA–60(f) of ASME Code).	Operating pressure (UA–60(f) of ASME Code).

[1] For basic pressure definitions see § 52.01–3(g) of this subchapter.

[2] For pressure differentials above 3,000 pounds per square inch (p.s.i.), special requirements may apply.

[3] For the basis for calculating test pressures, see UA–60(e) of the ASME Code.

§ 54.10–10 Standard hydrostatic test (modifies UG–99).

(a) All pressure vessels shall satisfactorily pass the hydrostatic test prescribed by this section, except those pressure vessels noted under § 54.10–15(a).

(b) The hydrostatic test pressure shall be at least one and one-half times the maximum allowable working pressure stamped on the pressure vessel, multiplied by the ratio of the stress value "S" at the test temperature to the stress value "S" at the design temperature for the materials of which the pressure vessel is constructed. The values for "S" shall be taken from Tables UCS 23, UNF 23, UHA 23, or UHT 23 of the ASME Code. The value of "S" at test temperature shall be that taken for the material of the tabulated value of temperature closest to the test temperature. The value of "S" at design temperature shall be as interpolated from the appropriate table. No ratio less than one shall be used. The stress resulting from the hydrostatic test shall not exceed 90 percent of the yield stress of the material at the test temperature. External loadings which will exist in supporting structure during the hydrostatic test should be considered. The design shall consider the combined stress during hydrostatic testing due to pressure and the support reactions. This stress shall not exceed 90 percent of the yield stress of the material at the test temperature. In addition the adequacy of the supporting structure during hydrostatic testing should be considered in the design.

(c) The hydrostatic test pressure shall be applied for a sufficient period of time to permit a thorough examination of all joints and connections. The test shall not be conducted until the vessel and liquid are at approximately the same temperature.

(d) Defects detected during the hydrostatic test or subsequent examination shall be completely removed and then inspected. Provided the marine inspector gives his approval, they may then be repaired.

(e) Vessels requiring stress relieving shall be stress relieved after any welding repairs have been made. (See UW–40 of the ASME Code.)

(f) After repairs have been made the vessel shall again be tested in the regular way, and if it passes the test, the marine inspector may accept it. If it does not pass the test, the marine inspector can order supplementary repairs, or, if in his judgment the vessel is not suitable for service, he may permanently reject it.

§ 54.10-15 Pneumatic test (modifies UG-100).

(a) Pneumatic testing of welded pressure vessels shall be permitted only for those units which are so designed and/or supported that they cannot be safely filled with water, or for those units which cannot be dried and are to be used in a service where traces of the testing medium cannot be tolerated.

(b) Proposals to pneumatically test shall be submitted to the cognizant Officer in Charge, Marine Inspection, for approval.

(c) Except for enameled vessels, for which the pneumatic test pressure shall be at least equal to, but need not exceed, the maximum allowable working pressure to be marked on the vessel, the pneumatic test pressure shall be at least equal to 1.25 times the maximum allowable working pressure to be stamped on the vessel multiplied by the lowest ratio (for the materials of which the vessel is constructed) of the stress value "S" for the test temperature of the vessel to the stress value "S" for the design temperature (see UG-21 of the ASME Code). In no case shall the pneumatic test pressure exceed 1.25 times the basis for calculated test pressure as defined in UA-60(e) of the ASME Code.

(d) The pneumatic test of pressure vessels shall be accomplished as follows:

(1) The pressure on the vessel shall be gradually increased to not more than half the test pressure.

(2) The pressure will then be increased at steps of approximately one-tenth the test pressure until the test pressure has been reached.

(3) The pressure will then be reduced to the maximum allowable working pressure of the vessel to permit examination.

(e) Pressure vessels pneumatically tested shall also be leak tested. The test shall be capable of detecting leakage consistent with the design requirements of the pressure vessel. Details of the leak test shall be submitted to the Commandant for approval.

(f) After satisfactory completion of the pneumatic pressure test, the vessel may be stamped in accordance with § 54.10-20. A marine inspector shall observe the pressure vessel in a loaded condition at the first opportunity following the pneumatic test. The tank supports and saddles, connecting piping, and insulation if provided shall be examined to determine if they are satisfactory and that no leaks are evident.

(g) The pneumatic test is inherently more hazardous than a hydrostatic test, and suitable precautions shall be taken to protect personnel and adjacent property.

§ 54.10-17 Certification by stamping.

Pressure vessels exempted from Coast Guard shop inspection and stamping by § 54.01-15(a)(4) shall have the full ASME stamping, including the appropriate Code symbol, as indicated in UG-115 through UG-119 of the ASME Code.

[CGFR 68-82, 33 FR 18828, Dec. 18, 1968, as amended by CGD 73-254, 40 FR 40164, Sept. 2, 1975]

§ 54.10-20 Marking and stamping.

(a) *Pressure vessels (replaces UG-116, except paragraph (k), and UG-118).* Upon satisfactory completion of tests and inspections, pressure vessels not exempted from Coast Guard shop inspection by § 54.01-15(a) shall be stamped or marked in a place that is readily visible with the following (items (5) through (7) may be omitted when not applicable):

(1) Manufacturer's name and serial number.

(2) Coast Guard number, see § 50.10-30 of this subchapter.

(3) Coast Guard symbol, which is affixed only by the marine inspector.

(4) Maximum allowable working pressure ——— at ———° F.

(5) Class if welded.

(6) Minimum service temperature allowed, if below 0° F.

(7) Water capacity in U.S. gallons, if a cargo carrying pressure vessel.

(b) *Multichambered pressure vessels (replaces UG-116(k)).* In cases where more than one pressure vessel is involved in an integral construction, as with a heat exchanger, the manufacturer may elect to class the component pressure vessels differently. In such cases he shall stamp the combined structures as required in paragraph (a) of this section with information for each pressure vessel. Where an item for stamping is identical for both vessels, as with name and address of manufacturer, it need not be duplicated. However, where differences exist, each value and the vessel to which it applies shall be clearly indicated.

(c) *Stamping data (replaces UG-117)*. Except as noted in paragraph (d) of this section, the data shall be stamped directly on the pressure vessel. The data shall be legibly stamped and shall not be obliterated during the service life of the pressure vessel. In the event that the portion of the pressure vessel upon which the data is stamped is to be insulated or otherwise covered, the data shall be reproduced on a metal nameplate. This plate shall be securely attached to the pressure vessel. The nameplate shall be maintained in a legible condition such that it may be easily read.

(1) Those parts of pressure vessels requiring inspection under this part which are furnished by other than the shop of the manufacturer responsible for the completed vessel shall be stamped with the Coast Guard symbol, the Marine Inspection Office identification letters (see § 50.10-30 of this subchapter) and the word "Part", the manufacturer's name and serial number, and the design pressure.

(d) Thin walled vessels (modifies UG-119). In lieu of direct stamping on the pressure vessel, the information required by paragraph (a) of this section shall be stamped on a nameplate permanently attached to the pressure vessel when the pressure vessel is constructed of—

(1) Steel plate less than one-fourth inch thick; or

(2) Nonferrous plate less than one-half inch thick.

[CGFR 68-82, 33 FR 18828, Dec. 18, 1968, as amended by CGFR 69-127, 35 FR 9977, June 17, 1970; CGD 72-206R, 38 FR 17226, June 29, 1973]

§ 54.10-25 Manufacturers' data report forms (modifies UG-120).

(a) The Manufacturers' data report form, as provided by the Coast Guard, shall be completed in duplicate and certified by the manufacturer for each pressure vessel required to be shop inspected under these regulations. The original of this form shall be delivered to the Coast Guard inspector.

(b) Data forms for those parts of a pressure vessel requiring inspection, which are furnished by other than the shop of the manufacturer responsible for the completed unit, shall be executed in triplicate by the manufacturer of the parts. The original and one copy shall be delivered to the Coast Guard inspector who shall forward one copy of the report to the Officer in Charge, Marine Inspection, having cognizance over the final assembly. These partial data reports, together with the final inspection and tests, shall be the final Coast Guard inspector's authority to apply the Coast Guard symbol and number. A final data report shall be executed by the manufacturer or assembler who completes the final assembly and tests.

[CGFR 69-127, 35 FR 9977, June 17, 1970]

Subpart 54.15—Pressure-Relief Devices

§ 54.15-1 General (modifies UG-125 through UG-134).

(a) All pressure vessels built in accordance with applicable requirements in division 1 of section VIII of the ASME Code shall be provided with protective devices as indicated in UG-125 through UG-134 except as noted otherwise in this subpart.

(b) The markings shall be in accordance with this chapter for devices covered by § 54.15-10.

§ 54.15-3 Definitions (modifies UA-60).

(a) Definitions applicable to this subpart are in § 52.01-3 of this subchapter.

§ 54.15-5 Protective devices (modifies UG-125).

(a) All pressure vessels, irrespective of size or pressure, shall be provided with protective devices. The protective devices shall be in accordance with the requirements of UG-125 through UG-134 of the ASME Code except as modified in this subpart.

(b) An unfired steam boiler evaporator or heat exchanger (see § 54.01-10) shall be equipped with protective devices as required by § 54.15-15.

(c) All pressure vessels other than unfired steam boilers shall be protected by pressure-relieving devices that will prevent the pressure from rising more than 10 percent above the maximum allowable working pressure, except when the excess pressure is caused by exposure to fire or other unexpected source of heat.

(d) Where an additional hazard can be created by exposure of a pressure vessel to fire or other unexpected sources of external heat (for example, vessels used to store liquefied flammable gases), supplemental pressure-relieving devices shall be installed to protect against excessive pressure. Such supplemental pressure-relieving devices shall be capable of preventing the pressure from rising more than 20 percent above the maximum allowable working pressure of the vessel. The minimum required relief capacities for compressed gas pressure vessels are given under § 54.15-25. A single pressure-relieving device may be used to satisfy the requirements of this paragraph and paragraph (c) of this section, provided it meets the requirements of both paragraphs.

(e) Pressure-relieving devices should be selected on the basis of their intended service. They shall be constructed, located, and installed so that they are readily accessible for inspection and repair and so arranged that they cannot be readily rendered inoperative.

(f) Where pressure-indicating gages are used, they shall be chosen to be compatible with the pressure to be indicated. The size of the visual display, the fineness of graduations, and the orientation of the display will be considered. In no case shall the upper range of the gage be less than 1.2 times nor more than 2 times the pressure at which the relieving device is set to function.

(g) The Commandant may authorize or require the use of a rupture disk in lieu of a relief or safety valve under certain conditions of pressure vessel use and design. See § 54.15-13.

(h) Vessels that are to operate completely filled with liquid shall be equipped with liquid relief valves unless otherwise protected against overpressure.

(i) The protective devices required under paragraph (a) of this section shall be installed directly on a pressure vessel except when the source of pressure is external to the vessel, and is under such positive control that the pressure in the vessel cannot exceed the maximum allowable working pressure at the operating temperature except as permitted in paragraphs (c) and (d) of this section:

NOTE: In the case of nuclear power plants pressure-reducing valves and similar mechanical or electrical control instruments, except for pilot operated valves as permitted in UG-126(b) of the ASME Code are not considered as sufficiently positive in action to prevent excess pressures from being developed.

(j) Pressure-relieving devices shall be constructed of materials suitable for the pressure, temperature, and other conditions of the service intended.

(k) The opening through all pipes and fittings between a pressure vessel and its pressure-relieving device shall have at least the area of the pressure-relieving device inlet, and in all cases shall have sufficient area so as not to unduly restrict the flow to the pressure-relieving device. The opening in the vessel shall be designed to provide direct and unobstructed flow between the vessel and its pressure-relieving device.

(l) Safety devices need not be provided by the pressure vessel manufacturer. However, overpressure protection shall be provided prior to placing the vessel in service.

§ 54.15-10 Safety and relief valves (modifies UG-126).

(a) All safety and relief valves for use on pressure vessels or piping systems shall be designed to meet the protection and service requirements for which they are intended and shall be set to relieve at a pressure which does not exceed the "maximum allowable working pressure" of the pressure vessel or piping system. Relief valves are not required to have huddling chambers for other than steam service. In addition, safety valves used on vessels in which steam is generated shall meet Subpart 162.001 in Subchapter Q (Specifications) of this chapter for service above 30 pounds per square inch gage pressure and Subpart 162.012 in Subchapter Q (Specifications) of this chapter for service below 30 pounds per square inch gage pressure. Safety relief valves used in liquefied compressed gas service shall meet Subpart 162.017 or 162.018 in Subchapter Q (Specifications) of this chapter as appropriate.

(b) Pilot-valve control or other indirect operation of safety valves is not permitted unless the design is such that the main unloading valve will open automatically at not over the set pressure and will discharge its full rated capacity if some essential part of the pilot or auxiliary device should fail. All other safety and relief valves shall be of the direct spring loaded type.

(c) Safety and relief valves for steam or air service shall be provided with a substantial lifting device so that the disk can be lifted from its seat when the pressure in the vessel is 75 percent of that at which the valve is set to blow.

(d) Safety and relief valves for service other than steam and air need not be provided with a lifting device although a lifting device is desirable if the vapors are such that their release will not create a hazard.

(e) If the design of a safety or relief valve is such that liquid can collect on the discharge side of the disk, the valve shall be equipped with a drain at the lowest point where liquid can collect (for installation, see UG–134 of section VIII of the ASME Code).

(f) Cast iron may be employed in the construction of relief valves for pressures not exceeding 125 pounds per square inch and temperatures not exceeding 450° F. Seats or disks of cast iron are prohibited.

(g) The spring in a relief valve in service for pressures up to and including 250 pounds per square inch shall not be reset for any pressure more than 10 percent above or 10 percent below that for which the relief valve is marked. For higher pressures, the spring shall not be reset for any pressure more than 5 percent above or 5 percent below that for which the relief valve is marked.

(h) The rated relieving capacity of safety and relief valves for use on pressure vessels shall be based on actual flow test data and the capacity shall be certified by the manufacturer in accordance with one of the following:

(1) 120 percent of the valve set pressure for valves rated in accordance with Compressed Gas Association Standard S–1.2.5.2.

(2) 110 percent of the valve set pressure for valves rated in accordance with UG–131 of section VIII of the ASME Code.

(3) 103 percent of the valve set pressure for steam in accordance with PG–69 of the ASME Code.

§ 54.15–13 Rupture disks (modifies UG–127).

(a) Paragraph UG–127 of the ASME Code provides for the use of rupture disks in series with spring loaded safety or relief valves.

(b) For certain pressure vessels containing substances which may render a relief or safety valve inoperative, or where the installation of a valve is considered impractical, the Commandant may authorize or require the use of a rupture disk in parallel with or in lieu of a spring loaded safety or relief valve. These rupture disks shall:

(1) Comply with the general provisions of § 54.15–5 except as noted otherwise in this section;

(2) Have a capacity for discharge such that the volume of release is sufficient to prevent the internal pressure from exceeding 120 percent of the "maximum allowable working pressure" with the pressure vessel exposed to fire conditions (see § 54.15–25); and,

(3) Operate at a pressure level which does not produce fatigue failure of the disk. The normal maximum operating pressure multiplied by 1.3 shall not exceed the nominal disk burst pressure. (Notice that this restriction for protection of the rupture disk will usually require operation below the "maximum allowable working pressure" of the pressure vessel and therefore should be considered in design.)

(c) All disks shall be oriented so that if rupture occurs, the disk fragments and pressure vessel discharge will be directed away from operating personnel and vital machinery.

§ 54.15-15 Relief devices for unfired steam boilers, evaporators, and heat exchangers (modifies UG-126).

(a) An approved safety valve set to relieve at a pressure not exceeding the "maximum allowable working pressure" of the shell shall be fitted to all unfired steam boilers and evaporators except for evaporators of the atmospheric type designed for vapor discharge direct to a distiller with no shutoff valve in the discharge line. The distiller connected to atmospheric evaporators shall be fitted with a vent to prevent a buildup in pressure. In no case shall the vent be less than 1½ inches in diameter. Evaporators operating between atmospheric pressure and 15 p.s.i.g., may use a rupture disc as an alternative to the safety valve.

(b) Safety valves for use on pressure vessels in which steam or pressure is generated shall comply with the requirements of § 54.15-10. Rupture discs used in lieu of these safety valves, as provided for in paragraph (a) of this section, shall comply with the requirements of § 54.15-13.

(c) The relieving capacity of evaporator safety valves required by paragraph (a) of this section shall be at least equal to the capacity of the orifice fitted in the steam supply to the evaporator. The orifice capacity shall be determined in accordance with the formula in paragraph (1) or (2) of this section (c) as appropriate:

(1) Where the set pressure of the evaporator shell safety valve is 58 percent or less than the setting of the safety valve in the steam supply:

$$W=51.45AP$$

(2) Where the set pressure of the evaporator shell safety valve exceeds 58 percent of the setting of the safety valve on the steam supply:

$$W=105.3A\sqrt{P_1(P-P_1)}$$

where:

W=The required orifice capacity, in pounds per hour.

A=Cross-sectional area of rounded entrance orifice, in square inches. The orifice shall be installed near the steam inlet or the coils or tubes and where no orifice is employed the area used in the formula shall be that of the inlet connection or manifold.

P=Set pressure of steam supply safety valve, in pounds per square inch, absolute.

P_1=Set pressure of evaporator shell safety valve, in pounds per square inch, absolute.

(d) The relieving capacity of safety valves on unfired steam boilers shall not be less than the maximum generating capacity of the unfired steam boiler as certified by the manufacturer.

(e) On new installations and where the orifice size of an existing unfired steam boiler or evaporator is increased, an accumulation test shall be made by closing all steam outlet connections except the safety valves for a period of five minutes. When conducting the accumulation test, the water shall be at the normal operating level and the steam pressure shall be at the normal operating pressure, and while under this test the pressure shall not rise more than 6 percent above the safety valve setting.

(f) A heat exchanger with liquid in the shell and the heating medium in the tubes or coils, shall be fitted with a liquid relief valve meeting the requirement of § 54.15-5.

(g)(1) A heat exchanger with steam in the shell and liquid in the tubes or coils at a pressure exceeding that in the shell, shall have a liquid relief valve fitted to protect the shell against excess pressure.

(2) The discharge capacity of such relief valves shall be calculated on the basis of the discharge from one tube using the difference in pressures between that in the shell and that in the

tubes and shall be not less than that determined by the following formula:

$$Q=29.81KD^2\sqrt{P_1-P_2}$$

where:

Q=Required relief valve discharge capacity, in gallons per minute, based on relief valve set pressure.

P_1=Pressure in the tube or coils, in pounds per square inch.

P_2=Set pressure of the shell relief valve, in pounds per square inch.

D=Internal diameter of the largest tube or coil, in inches.

K=Coefficient of discharge=0.62.

[CGFR 68-82, 33 FR 18828, Dec. 18, 1968, as amended by CGD 72-206R, 38 FR 17226, June 29, 1973]

§ 54.15-25 Minimum relief capacities for cargo tanks containing compressed or liquefied gas.

(a) Each tank shall be fitted with one or more safety relief valves designed, constructed, and flow tested in accordance with Subpart 162.017 or 162.018 in Subchapter Q (Specifications) of this chapter. Valves conforming to specification Subpart 162.017 shall be limited to use on tanks whose maximum allowable working pressure is not in excess of 10 pounds per square inch. With specific approval of the Commandant, such valves may be connected to the vessel in lieu of being directly fitted to the tanks.

(b) The discharge pressure and the maximum overpressure permitted shall be in accordance with § 54.15-5.

(c) The rate of discharge for heat input of fire must meet the following formula:

$$Q=FGA^{0.82}$$

Where:

Q=minimum required rate of discharge in cubic meters (cubic feet) per minute of air at standard conditions 0° C and 1.03 kp/cm² (60° F and 14.7 psia).

F=fire exposure factor for the following tank types:

F=1.0 for tanks without insulation located on the open deck.

F=0.5 for tanks on the open deck having insulation that has approved fire proofing, thermal conductance, and stability under fire exposure.

F=0.5 for uninsulated independent tasks installed in holds.

F=0/2 for insulated independent tanks in holds or for uninsulated independent tanks in insulated holds.

F=0.1 for insulated independent tanks in inerted holds or for uninsulated independent tanks in inerted, insulated holds.

F=0.1 for membrane and semi-membrane tanks.

G=gas factor of:

$$G=\frac{177}{LC}\sqrt{\frac{ZT}{M}}\left(G=\frac{633{,}000}{LC}\sqrt{\frac{ZT}{M}}\right)$$

Where:

L=latent heat of the material being vaporized at the relieving conditions, in Kcal/kg (Btu per pound).

C=constant based on relation of specific heats (k), Table § 54.15-25(c) (if k is not known, C=.606(315)).

Z=compressibility factor of the gas at the relieving conditions (if not known, Z=1.0).

T=temperature in degrees K=(273 + degrees C) (R=(460 + degrees F)) at the relieving conditions (120% of the pressure at which the pressure relief valve is set).

M=molecular weight of the product.

A=external surface area of the tank in m² (sq. ft.) for the following tank types:

For a tank of a body of revolution shape:

A=external surface area.

For a tank other than a body of revolution shape:

A=external surface area less the projected bottom surface area.

For a grouping of pressure vessel tanks having insulation on the vessel's structure:

A=external surface area of the hold without the projected bottom area.

For a grouping of pressure tanks having insulation on the tank:

A=external surface area of the pressure tanks excluding insulation, and without the projected bottom area.[1]

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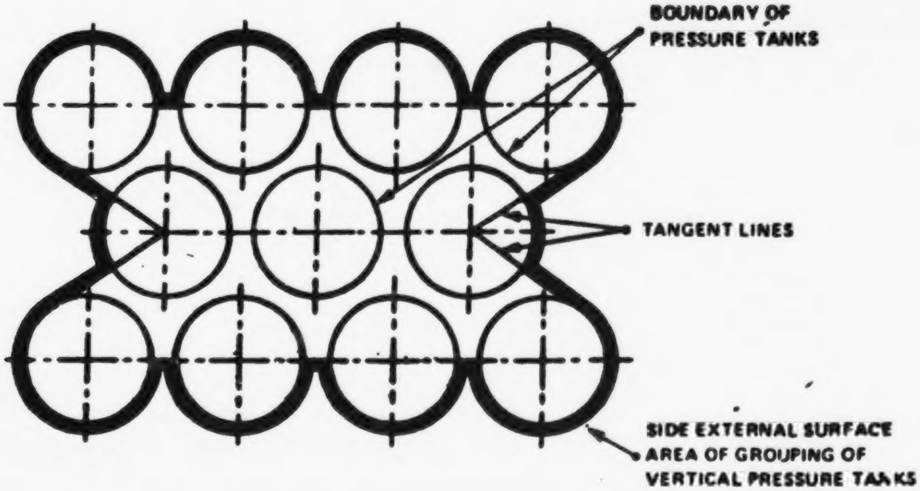
[1] Figure 54.15-25(c) shows a method of determining the side external surface area of a grouping of vertical pressure tanks.


BOUNDARY OF PRESSURE TANKS
TANGENT LINES
SIDE EXTERNAL SURFACE AREA OF GROUPING OF VERTICAL PRESSURE TANKS

SIDE EXTERNAL SURFACE AREA OF GROUPING OF VERTICAL PRESSURE TANKS

Figure 54.15–25 (c)

TABLE 54.15–25(c)—*Constant C*

k	C	
1.00	.606	(315)
1.02	.611	(318)
1.04	.615	(320)
1.06	.620	(322)
1.08	.624	(324)
1.10	.628	(327)
1.12	.633	(329)
1.14	.637	(331)
1.16	.641	(333)
1.18	.645	(335)
1.20	.649	(337)
1.22	.652	(339)
1.24	.656	(341)
1.26	.660	(343)
1.28	.664	(345)
1.30	.667	(347)
1.32	.671	(349)
1.34	.674	(351)
1.36	.677	(352)
1.38	.681	(354)
1.40	.685	(356)
1.42	.688	(358)
1.44	.691	(359)
1.46	.695	(361)
1.48	.698	(363)
1.50	.701	(364)
1.52	.704	(366)
1.54	.707	(368)
1.56	.710	(369)
1.58	.713	(371)
1.60	.716	(372)
1.62	.719	(374)
1.64	.722	(376)
1.66	.725	(377)
1.68	.728	(379)
1.70	.731	(380)
1.72	.734	(382)
1.74	.736	(383)
1.76	.739	(384)
1.78	.742	(386)
1.80	.745	(387)
1.82	.747	(388)
1.84	.750	(390)
1.86	.752	(391)
1.88	.755	(392)
1.90	.758	(394)
1.92	.760	(395)
1.94	.763	(397)
1.96	.765	(398)
1.98	.767	(399)
2.00	.770	(400)
2.02	.772	(401)
2.20	.792	(412)

(c-1) For an independent tank that has a portion of the tank protruding above the open deck, the fire exposure factor must be calculated for the surface area above the deck and the surface area below the deck, and this calculation must be specially approved by the Commandant (G-MMT).

(d) In determining the total safety valve relieving capacity, the arrangement and location of the valves on the tank will be evaluated. The valves shall be placed so that a number of valves sufficient to provide the required relieving capacity shall always be in communication with the cargo vapor phase. The possible motions which the tank may see in its intended service and attendant changes in cargo liquid level will be considered. Shut off valves shall not be installed between the vessel and the safety relief valves. Manifolds for mounting multiple relief valves may be fitted with acceptable interlocking shut off valves so arranged that the required capacity of discharge will be "lined up" at all times.

(e)(1) Each safety relief valve shall be tested in the presence of a marine inspector before being placed in service except as noted otherwise in paragraph (e)(2) of this section. The test shall satisfactorily show that the valve will start to discharge at the required minimum pressure.

(2) Each safety relief valve fitted with a breaking pin and rupture disk need not be tested in the presence of a marine inspector before being placed in service. In lieu thereof, a certificate shall be furnished with the valve attested to by the manufacturer that the test requirements of paragraph (e)(1) of this section have been met.

(92 Stat. 1480 (Port and Tanker Safety Act of 1978, 46 U.S.C. 391a; 49 CFR 1.46(n)(4))

[CGFR 68-82, 33 FR 18828, Dec. 18, 1968, as amended by CGD 74-289, 44 FR 26007, May 3, 1979]

Subpart 54.20—Fabrication by Welding

§ 54.20-1 Scope (modifies UW-1 through UW-65).

(a) Pressure vessels and vessel parts that are fabricated by welding shall be as required by paragraphs UW-1 through UW-65 of section VIII of the ASME Code except as noted otherwise in this subchapter.

§ 54.20-2 Fabrication for dangerous substances (replaces UW-2(a)).

(a) Pressure vessels containing dangerous articles or substances as defined in Subchapters N or O of this chapter shall be of the class and construction required by Subchapters D, I, O, or, when not specified, of the class as determined by the Commandant.

(b) Class III pressure vessels must not be used for the storage or stowage of dangerous substances unless there is specific authorization in Subchapters D, I, N, or O.

[CGFR 72-59R, 37 FR 6189, Mar. 25, 1972]

§ 54.20-3 Design (modifies UW-9, UW-11 (a), UW-13, and UW-16).

(a) Fabrication by welding shall be in accordance with the provisions of this part and with Part 57 of this subchapter.

(b) Welding subject to UW-11(a) of the ASME Code shall be modified as described in § 54.25-8 for radiographic examination.

(c) A butt welded joint with one plate edge offset, Figure UW-13.1(k) of the ASME Code, may be used in the fabrication of Class II and Class III pressure vessels only, and then shall be subject to the limitations of Table UW-12 of the ASME Code.

(d) Attachment welds for nozzles and other connections shall be in accordance with UW-16 of the ASME Code. When nozzles or connections are made to pressure vessels, as shown in Figure UW-16.1 (a) and (c) of the ASME Code, and are welded from one side only, backing strips shall be used unless it can be determined visually that a full penetration weld has been achieved.

(e) When fabricating by welding the minimum joint requirements shall be as specified under the column headed "minimum joint requirements" in Table 54.01-5(b) for various classes of pressure vessels.

§ 54.20-5 Welding qualification tests and production testing (modifies UW-26, UW-28, UW-29, UW-47, and UW-48).

(a) *Performance and procedure qualification.* No production welding shall be done until welding procedures and welders have been qualified in accordance with Part 57 of this subchapter.

(b) *Tests.* Production tests are required in accordance with § 57.06-1 of this subchapter.

[CGFR 68-82, 33 FR 18828, Dec. 18, 1968, as amended by CGFR 69-127, 35 FR 9977, June 17, 1970]

§ 54.20-10 Spot-examination of welded joints (replaces UW-52(c)(3)).

(a) In examination of spot-radiographs the following shall be used in lieu of UW-52(c)(3) of the ASME Code: "While porosity is not disqualifying, it should be noted when viewing the radiograph; and gross porosity may be an indication of welding procedure difficulties."

[CGFR 68-82, 33 FR 18828, Dec. 18, 1968, as amended by CGD 73-254, 40 FR 40164, Sept. 2, 1975]

Subpart 54.23—Fabrication by Brazing

§ 54.23-1 Scope (modifies UB-1).

(a) Fabrication by brazing shall be in accordance with the provisions of this part and with Part 57 of this subchapter.

[CGFR 69-127, 35 FR 9977, June 17, 1970]

Subpart 54.25—Construction With Carbon, Alloy, and Heat Treated Steels

§ 54.25-1 Scope.

(a) The carbon, alloy, and heat treated steels used in construction of pressure vessels and parts shall be as indicated in section VIII of the ASME Code except as noted otherwise in this subpart.

§ 54.25-3 Steel plates (modifies UCS-6).

(a) The steels listed in UCS-6(b) and UCS-6(c) of the ASME Code will be allowed only in Class III pressure vessels (see Table 54.01-5(b)).

§ 54.25-5 Corrosion allowance (replaces UCS-25).

(a) The corrosion allowance shall be as required in § 54.01-35 in lieu of requirements in UCS-25 of the ASME Code.

§ 54.25-7 Requirement for postweld heat treatment (modifies UCS-56).

(a) Postweld heat treatment is required for all carbon and low alloy steel Class I, I-L, and II-L vessels regardless of thickness. (Refer to Table 54.01-5(b) for applicable requirements.)

(b) Cargo tanks which are fabricated of carbon or low alloy steel as Class II pressure vessels, designed for pressures exceeding 100 pounds per square inch gage and used in the storage or transportation of liquefied compressed gases shall be postweld heat treated regardless of thickness.

[CGFR 69-127, 35 FR 9977, June 17, 1970]

§ 54.25-8 Requirements for radiography (modifies UW-11(a) and USC-57).

(a) Full radiography is required for all Class I and Class I-L vessels regardless of thickness. (Refer to Table 54.01-5(b) for applicable requirements.)

(b) Class II-L vessels shall be spot radiographed. The exemption provided in UW-11(c) of the ASME Code does not apply. (Refer to Table 54.01-5(b) for applicable requirements.)

§ 54.25-10 Low temperature operation—ferritic steels (replaces UCS-65 through UCS-67).

(a) *Scope.* (1) This section contains requirements for pressure vessels and nonpressure vessel type tanks and associated secondary barrier, as defined in § 38.05-4 and § 154.3 of this chapter, and their parts constructed of carbon and alloy steels which are stressed at operating or hydrostatic test temperatures below 0° F.

(2) The service temperature is the minimum temperature of a product at which it may be contained, loaded and/or transported. However, the service temperature shall in no case be taken higher than given by the following formula:

$$t_s = t_w - 0.25(t_w - t_B)$$

where:

t_s=Service temperature.
t_w=Boiling temperature of gas at normal working pressure of container but not higher than +32° F.
t_B=Boiling temperature of gas at atmospheric pressure.

Under normal circumstances, only temperatures due to refrigerated service will be considered in determining the service temperature. Refrigerated service for purposes of this paragraph is defined as service where the temperature is controlled in the process rather than being caused by atmospheric conditions.

(b) *Specifications.* Materials used in the construction of vessels to operate below 0° F. (but not below the designated minimum service temperature) shall conform to a specification given in Table UCS-23 in the ASME Code and the following additional requirements:

NOTE: For high alloy steels refer to § 54.25-15. For heat treated steels refer to § 54.25-20.

(1)(i) For minimum service temperatures not lower than −67° F., ferritic steels shall be made with fine grain practice and shall have an austenitic grain size of 5 or finer, and shall be normalized. Consideration will be given to other heat treatments. Refer to § 57.03-1(d) of this subchapter. Plate for pressure vessel applications shall conform to the requirements of ASTM A-20. It may be produced by the open hearth, basic oxygen or electric furnace process and shall conform to the requirements of Table 54.25-10(b)(1). (Other alloying elements may only be present in trace amounts.)

(ii) Mechanical properties shall be within the following limits:

Ultimate strength	—58,000[1]–85,000[1] p.s.i.
Yield strength	—Minimum 35,000 p.s.i. —Maximum 80 percent of ultimate.
Elongation minimum	—20 percent in 8 inches, or —24 percent in 2 inches, or —22 percent in 5.65 $\sqrt{A}$, where "A" is the test specimen cross sectional area.

TABLE 54.25–10(b)(1)

Minimum service[1] temperature °F	Max. C[1] percent	Manganese range[1] percent
−30	0.20	0.70–1.35
−50	.16	1.15–1.50
−67	.12	1.30–1.60

[1] At service temperatures intermediate between those specified, intermediate amounts of carbon and manganese will be allowed (in proportion to the actual service temperature variation from that listed), provided all other chemical and mechanical properties specified for steels in this temperature range are satisfied.

	Range percent
Si	0.10–0.50

	Maximum
S	0.035

	Range percent
P	0.035
Ni	0.80
Cr	0.25
Mo	0.08
Cu	0.035
Nb	0.05
V	0.08

(2) For minimum service temperature below −67° F., but not below the designated minimum service temperature, ferritic steels shall be normalized, low carbon, fully killed, fine grain, nickel alloy type, conforming to any one of the specifications in Table 54.25-10(b)(2). Consideration will be given to other heat treatments. Refer to § 57.03-1(d) of this subchapter for quenched and tempered steels. The ultimate and yield strengths shall be as shown in the applicable specification and shall be suitable to the design stress levels adopted. The service temperature shall not be colder than the minimum specified in Table 54.25-10(b)(2) for each steel.

TABLE 54.25–10(b)(2)

Steel	Minimum service temperature
A-203, 2¼ percent, Ni, normalized.	−80° F. for Grade A. −75° F. for Grade B.
A-203, 3½ percent, Ni, normalized.	−130° F. for Grade D. −110° F. for Grade E.
5 percent Ni, normalized	Dependent on chemical and physical properties.

(3) The materials permitted under paragraphs (b) (1) and (2) of this section shall be tested for toughness in accordance with and shall satisfy the applicable requirements of Subpart 54.05.

(4) Welded pressure vessels or nonpressure vessel type tanks and associated secondary barriers, as defined in § 38.05-4 of Subchapter D (Tank Vessels) of this chapter shall meet the toughness requirements of Subparts 57.03 and 57.06 of this subchapter with regard to weld procedure qualifications and production testing.

(5) The material manufacturer's identification marking required by the material specification shall not be diestamped on plate material less than one-fourth inch in thickness.

(c) *Design.* Pressure vessels must meet the requirements for Class I-L and II-L construction. (See Table 54.01-5(b) for applicable requirements). Except as permitted by § 54.05-30, the allowable stress values used in the design of low temperature pressure vessels may not exceed those given in Table UCS-23 of the ASME Code for temperatures of 0° F. to 650° F. For materials not listed in this Table allowable stress values are determined in accordance with Appendix P of Section VIII of the ASME Code.

(92 Stat. 1480 (Port and Tanker Safety Act of 1978, 46 U.S.C. 391a); 49 CFR 1.46(n)(4))

[CGFR 68-82, 33 FR 18828, Dec. 18, 1968, as amended by CGFR 69-127, 35 FR 9977, June 17, 1970; CGD 73-133R, 39 FR 9178, Mar. 8, 1974; CGD 74-289, 44 FR 26007, May 3, 1979]

§ 54.25-15 Low temperature operation—high alloy steels (modifies UHA-23(b) and UHA-51).

(a) Toughness tests for the materials listed in UHA-51(a) of the ASME Code for service temperatures below −425° F., UHA-51(b)(1) through (5) for service temperatures below 0° F., and UHA-51(c) for all service temperatures, shall be performed in accordance with the requirements of Subpart 54.05. These requirements are also applicable to nonpressure vessel type, low temperature tanks and associated secondary barriers, as defined in § 38.05-4 in Subchapter D (Tank Vessels) of this chapter. Such tests are required regardless of the vessel's design stress. Service temperature is defined in § 54.25-10(a)(2).

(b) Materials for pressure vessels with service temperatures below −320° F. shall be of the stabilized or low carbon (less than 0.10 percent) austenitic stainless steel type, produced according to the applicable specifications of Table UHA-23 of the ASME Code. These materials and their weldments shall be tested for toughness according to the requirements of Subpart 54.05 except that the Charpy V-notch testing acceptance criteria will be in accordance with UHT-6(a)(4) and (5) of the ASME Code."

(c) Except as permitted by § 54.05-30, the allowable stress values used in the design of low temperature pressure vessels may not exceed those given in Table UHA-23 of the ASME Code for temperatures of −20° F. to 100° F.

[CGFR 68-82, 33 FR 18828, Dec. 18, 1968, as amended by CGD 73-133R, 39 FR 9178, Mar. 8, 1974; CGD 73-254, 40 FR 40164, Sept. 2, 1975]

§ 54.25-20 Low temperature operation—ferritic steels with properties enhanced by heat treatment (modifies UHT-5(c), UHT-6, UHT-23, and UHT-82).

(a) For service temperatures below 0° F. but not below the designated minimum service temperature, steel conforming to the specifications of Table 54.25-20(a) may be used in the fabrication of pressure vessels and nonpressure vessel tanks and associated secondary barriers, as defined in § 38.05-4 of Subchapter D (Tank Vessels) of this chapter. The ultimate and yield strengths shall be as shown in the applicable specification and shall be suitable for the design stress levels adopted. The service temperature shall not be colder than −320° F. Service temperature is defined in § 54.25-10(a) (2).

TABLE 54.25-20(a)

Steel	Minimum service temperature, °F.
A-333, 9 percent Ni, grade 8	−320
A-334, 9 percent Ni, grade 8	−320
A-353, 9 percent Ni, double normalized and tempered	−320
A-522, 9 percent Ni, NNT, Q and T, forging	−320
A-553, 9 percent Ni, quenched and tempered	−320

(b) The materials permitted under paragraph (a) of this section shall be tested for toughness in accordance with the requirements of UHT-6 of the ASME Code except that tests shall be conducted at the temperature specified in § 54.05-6 in lieu of that in UHT-5(c) of the ASME Code. Lateral expansion in a broken Charpy V-notch specimen is illustrated in Figure 54.25-20(b) and shall be measured in accordance with the procedure outlined in ASTM A-370.

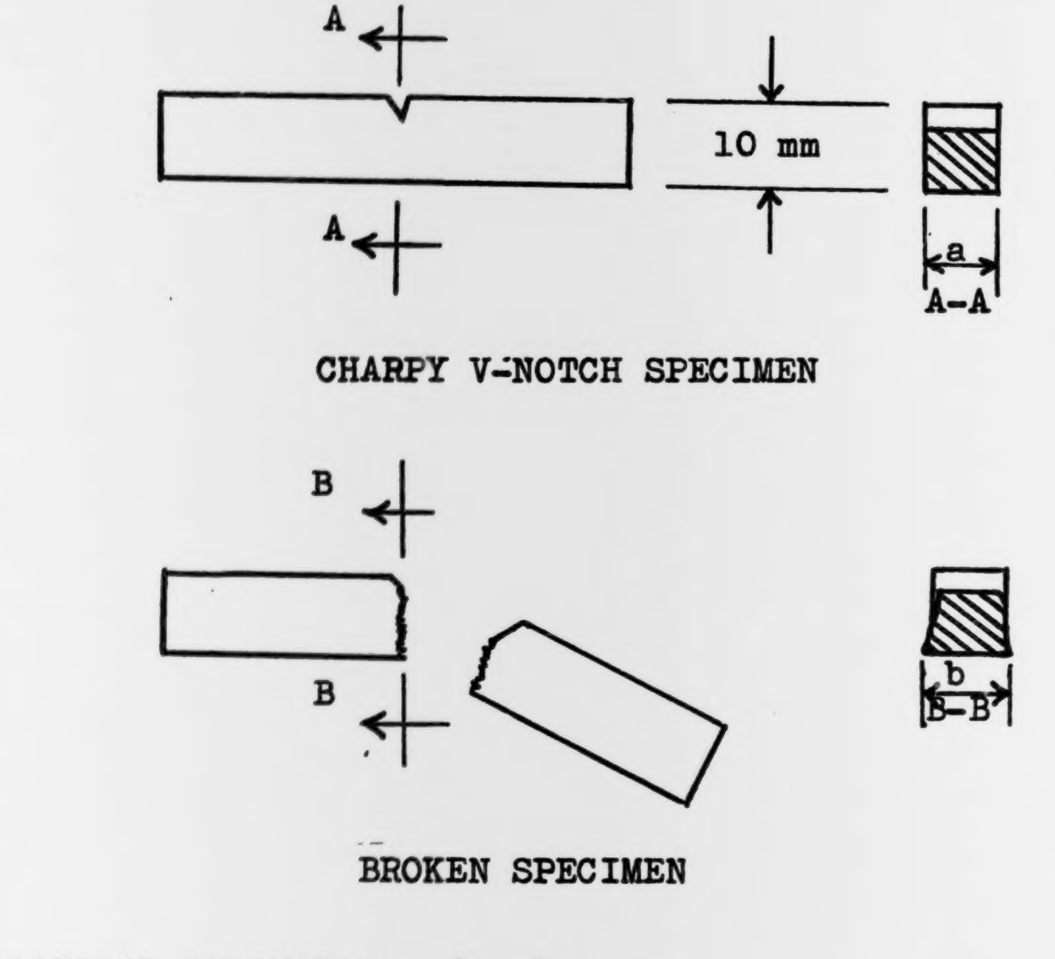
(c) The qualification of welding procedures and welders and weld production testing for the steels of Table

54.25-20(a) shall conform to the requirements of Part 57 of this subchapter and Subpart 54.05 except that the Charpy V-notch testing acceptance criteria shall be in accordance with UHT-6(a) (4) and (5) of the ASME Code.

(d) The values of absorbed energy in foot-pounds and of fracture appearance in percentage shear, which are recorded for information when complying with paragraphs (b) and (c) of this section shall also be reported to the marine inspector or the Commandant, as applicable.

(e) Except as permitted by § 54.05-30, the allowable stress values may not exceed those given in Table UHT-23 of the ASME Code for temperatures of 150° F. and below.

[CGFR 68-82, 33 FR 18828, Dec. 18, 1968, as amended by CGD 73-133R, 39 FR 9179, Mar. 8, 1974]



CHARPY V-NOTCH SPECIMEN

BROKEN SPECIMEN

LATERAL EXPANSION = (b-a)

FIGURE 54.25-20(b)

§ 54.25-25 Welding of quenched and tempered steels (modified UHT-82).

(a) The welding requirements in UHT-82 of the ASME Code shall be modified to require that the qualification of welding procedures and welders and weld production testing shall conform to the requirements of Part 57 of this subchapter. The requirements are § 57.03-1(d) of this subchapter are applicable to welded pressure vessels and nonpressure vessel type tanks of quenched and tempered steels other than 9 percent nickel.

Subpart 54.30—Mechanical Stress Relief

§ 54.30-1 Scope.

(a) Certain pressure vessels may be mechanically stress relieved in accordance with the requirements in this subpart.

§ 54.30-3 Introduction.

(a) Large conventional pressure vessels used to transport liquefied petroleum and natural gases, at "low temperatures" may often be difficult to thermally stress relieve. Where no other problem, such as corrosion exists, mechanical stress relief will be permitted for Class II-L pressure vessels.

(b) Mechanical stress relief serves to cause small flaws, particularly in the weld zone, to yield plastically at the flaw tip resulting in a local relief of stress and a blunting of the crack tip. To achieve the maximum benefit from mechanical stress relief, it is necessary that the stresses so imposed be more severe than those expected in normal service life. At the same time, it is necessary that the stresses which are imposed are not so high as to result in appreciable deformation or general yielding.

(c) The weld joint efficiencies as listed in Table UW-12 of the ASME Code shall apply except that a minimum of spot radiography will be required. UW-12(c) of the ASME Code which permits omitting all radiography does not apply. Spot examination shall follow UW-52 of the ASME Code and in addition these vessels will be required to have radiographic examination of intersecting circumferential and longitudinal joints for a distance of at least 20 times the plate thickness from the junction. See § 54.20-10 on spot radiography.

(d) Severe cold forming will not be permitted unless thermal stress relief is used. For example, parts of the vessels which are individually cold formed, such as heads, must be thermally stress relieved, where the extreme fiber strain measured at the surface exceeds 5 percent as determined by:

$$\text{Percent strain}=(65t/R_f)[1-(R_f/R_o)]$$

where:
t=Plate thickness.
R_f=Final radius.
R_o=Original radius (equals infinity for flat plate).

§ 54.30-5 Limitations and requirements.

(a) Class II-L pressure vessels which require stress relief (see Table 54.01-5(b)) may be mechanically stress relieved provided:

(1) The steels from which they are fabricated do not specifically require thermal stress relief in UCS-56 of the ASME Code and have a ratio of yield to ultimate tensile strength not greater than 0.8. For example: A-537 steels could be mechanically stress relieved.

(2) Pressure difference across the shell is not greater than 100 pounds per square inch, thickness of shell is not greater than 1 inch, and the design temperature is not greater than 115° F.

(3) It will carry liquids of specific gravity no greater than 1.05.

(4) Design details are sufficient to eliminate stress concentrators: Mechanical stress relief is not acceptable in designs involving the following types of welded connections shown in UW-16.1 of the ASME Code:

(i) Types l, m, n, and p because of nonintegral reinforcement. Type o will be acceptable provided the plate, nozzle, and reinforcement assembly are furnace stress relieved and the reinforcement is at least 6 inches or 10t, whichever is larger, from the plate head.

(ii) Types d, e, and f because expansion and contraction stresses are concentrated at the junction points.

(5) That no slip-on flanges in sizes greater than 2 inches are used.

(6) The categories A and B joints are type one as described in Table UW-12 of the ASME Code and all categories C and D joints are full penetration welds. See UW-3 of the ASME Code for definition of categories.

(b) When a pressure vessel is to be mechanically stress relieved in accordance with § 54.30-10(a)(1), its maximum allowable working pressure will be 40 percent of the value which would otherwise be determined. However, an increase of this 40 percent factor may be permitted if the stress relief is carried out at a pressure higher than that required by § 54.30-10(a)(1) and an experimental strain analysis is carried out during stress relief. This evaluation should provide information as to the strains at the saddles, welded seams and nozzles as well as the body of the vessel. The hydrostatic pressure applied during stress relief should be such that, except in the case of welds, the stresses in the vessel shall closely approach but not exceed 90 percent of the yield stress of the material at the test temperature. The proposed experimental program should be submitted to the Commandant for approval prior to its use. Photo-elastic coating, strain gaging, or a brittle coating technique is suggested for the experimental analysis.

§ 54.30–10 Method of performing mechanical stress relief.

(a) The mechanical stress relief shall be carried out in accordance with the following stipulations using water as the pressurizing medium:

(1) At a hydrostatic pressure (measured at the tank top) of 1½ times the design pressure. (See UA-60(e) of the ASME Code.)

(2) At a temperature of 70° F. or the service temperature plus 50° F., whichever is higher. Where the ambient temperature is below 70° F., and use of water at that temperature is not practical, the minimum temperature for mechanical stress relief may be below 70° F. but shall not be less than 50° F. above service temperature.

(3) The stress relief shall be at the required temperature and pressure and held for a period not less than 2 hours per inch of metal thickness, but in no case less than 2 hours.

(b) It is considered preferable that mechanical stress relief be accomplished with the tanks in place on their saddles or supporting structure in the barge or ship in which they will be utilized. In any case, it is considered mandatory that the tank be supported only by its regular saddles or supporting structure, without any auxiliary or temporary supports.

§ 54.30–15 Requirement for analysis and computation.

(a) A stress analysis shall be performed to determine if the tank may be exposed to excessive loadings during the mechanical stress relief process. This analysis should include consideration of the local stresses in way of saddles or other supporting structure and additional bending stresses due to the weight of the pressurizing liquid particularly in areas of high stress concentration. While it is necessary that the general stress level during the process be in excess of the normal working level, the calculated maximum stress during test shall not exceed 90 percent of the yield strength of the material at test temperature. The supporting structure shall be analyzed to verify its adequacy.

(b) In all cases where the tanks are mechanically stress relieved in place in the ship or barge and the tanks are designed to carry cargoes with a specific gravity less than 1.05, the ship or barge shall be shown to have adequate stability and buoyancy, as well as strength to carry the excess weight of the tank during the stress relief procedure.

PART 55—NUCLEAR POWERPLANT COMPONENTS

Subpart 55.01—General Requirements

Sec.
55.01-1 Adoption of section III Division 1 of the ASME Code.

Subpart 55.05—Responsibilities and Duties

55.05-1 General (modifies Article NA-3000).

Subpart 55.10—Class 1 Components

55.10-1 General (modifies subsection NB).
55.10-5 Design.
55.10-20 Welding and fabrication.
55.10-25 Quenched and tempered steels.
55.10-30 Marking and stamping (modifies NA-8000).
55.10-35 Manufacturers' data reports (modifies NA-8400).

Sec.
55.10-40 Overpressure protection (modifies NB-7000).

Subpart 55.15—Class B Vessels

55.15-1 General (modifies subsection NE).
55.15-3 Design (modifies NE-3100).
55.15-5 Welding and fabrication (modifies NE-4300).
55.15-10 Stamping and reports (modifies NE-8000).
55.15-15 Overpressure and vacuum relief protection (modifies NE-7000).

Subpart 55.20—Class 2 Components

55.20-1 General (modifies subsection NC).
55.20-5 Weld production testing.
55.20-10 Overpressure protection.
55.20-20 Stamping (modifies NA-8000).

Subpart 55.25—Class 3 Components

55.25-1 General (modifies subsection ND).
55.25-10 Stamping (modifies NA-8000).

AUTHORITY: R.S. 4405, as amended, 4462, as amended, secs. 2, 633, 63 Stat. 496, 545, sec. 6(b)(1), 80 Stat. 938; 46 U.S.C. 375, 416, 14 U.S.C. 2, 633, 49 U.S.C. 1655(b); 49 CFR 1.4(a)(2), (f). R.S. 4399, as amended, 4400, as amended, 4417, as amended, 4417a, as amended, 4418, as amended, 4421, as amended, 4426-4431, as amended, 4433, as amended, 4434, as amended, 4453, as amended, 4472, as amended, 4488, as amended, 4491, as amended, sec. 2, 23 Stat. 118, as amended, sec. 14, 29 Stat. 690, as amended, sec. 10, 35 Stat. 428, as amended, 41 Stat. 305, as amended, secs. 1, 2, 49 Stat. 1544, 1545, as amended, sec. 17, 54 Stat. 166, as amended, sec. 3, 54 Stat. 347, as amended, sec. 3, 70 Stat. 152, sec. 3, 68 Stat. 675; 46 U.S.C. 361, 362, 391, 391a, 392, 399, 404-409, 411, 412, 435, 170, 481, 489, 2, 366, 395, 363, 367, 526p, 1333, 390b, 50 U.S.C. 198; E.O. 11239, July 31, 1965, 30 FR 9671, 3 CFR, 1965 Supp., unless otherwise noted.

SOURCE: CGFR 68-82, 33 FR 18841, Dec. 18, 1968, unless otherwise noted.

Subpart 55.01—General Requirements

NOTE: See § 50.15-5 for general adoption of the ASME (American Society of Mechanical Engineers) Code. The adoption of section III of the ASME Code, for nuclear powerplant components, is subject to specific limitations or modifications as described in this part. Those requirements in section III of the ASME Code which are not referred to in this part are adopted without change. Table 55.01-1(a) sets forth a general reference to various paragraphs in section III of the ASME Code which are limited, modified or replaced by regulations in this part.[1]

§ 55.01-1 Adoption of section III Division 1 of the ASME Code.

(a) Nuclear powerplant components shall be designed, constructed and inspected in accordance with section III of the ASME (American Society of Mechanical Engineers) Code, as limited, modified, or replaced by specific requirements in this part. The provisions in the appendices to section III of the ASME Code are adopted and shall be followed when the requirements in section III make them mandatory. For general information Table 55.01-1(a) lists the various paragraphs in section III of the ASME Code which are limited, modified, or replaced by regulations in this part.

TABLE 55.01-1—LIMITATIONS AND MODIFICATIONS IN THE ADOPTION OF SECTION III DIVISION 1 OF THE ASME CODE

Paragraphs in section III, ASME Code,[1] and disposition	Unit of this part
NA-3000 modified by	55.05-1.
NA-8000 modified by	55.10-30.
NA-8400 modified by	55.10-35.
NB modified by	55.10-1.
NB-3111 modified by	55.10-5.
NB-4300 modified by	55.10-20(a).
NB-4330 and NB-4335 modified by	55.10-20(b).
NB-7000 modified by	55.10-40.
NB-7611 and NB-7612 modified by	55.10-40(b).
NB-7613, NB-7620, and NB-7630 modified by.	55.10-40(c).
NB-7640 modified by	55.10-40(b).
NC modified by	55.20-1.
NA-8000 modified by	55.20-20.
ND modified by	55.25-1.
NA-8000 modified by	55.25-10.
NE modified by	55.15-1.
NE-3100 modified by	55.15-3.
NE-7000 modified by	55.15-15.
NE-7116 modified by	55.15-15(a).
NE-8000 modified by	55.15-10.

[1] The references to specific provisions in the ASME Code are coded. The first letter "N" refers to Section III. The second letter refers to the subsection of section III. The number refers to the paragraph so identified in the text of section III.

(1) As stated in § 50.15-5 of this subchapter, section III division 1 of the ASME Code is adopted and shall be the governing requirements for nuclear powerplant components unless specifically limited, modified, or replaced by other regulations in this part.

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[1] 38 FR 17227, June 29, 1973.

(b) References to the ASME Code, such as paragraph N-1130, indicate:

N=Section III, Nuclear Vessels, ASME Code.
A-Subsection NA containing general requirements.
—1130-Paragraph within Subsection NA.

(c) When a paragraph or a section of the regulations relates to material in section III of the ASME Code, the relationship with the code will be shown immediately following the heading of the section or at the beginning of the paragraph as follows:

(1) (Modifies N———.) This indicates that the material in N——— is generally applicable but is being altered, amplified or augmented.

(2) (Replaces N———.) This indicates that N——— does not apply.

(3) (Reproduces N———.) This indicates that N——— is being identically reproduced for convenience, not for emphasis.

(Sec. 552, 80 Stat. 383, as amended; 5 U.S.C. 552)

[CGFR 68-82, 33 FR 18828, Dec. 18, 1968, as amended by CGFR 69-127, 35 FR 9977, June 17, 1970; CGD 72-206R, 38 FR 17227, June 29, 1973]

Subpart 55.05—Responsibilities and Duties

§ 55.05-1 General (modifies Article NA-3000).

(a) The ship or barge owner or his agent shall comply with NA-3200 except that he need not possess the Society's certificate of authorization nor file an owner's data report as required by NA-3270. The owner or his agent shall submit to the Coast Guard (MMT) the following materials as a minimum:

(1) A preliminary design specification which lists the applicable design codes and standards; design criteria and requirements; materials specifications; quality control provisions; documentation to be provided together with identification of specific components and parts of the powerplant; packaging (if applicable) and cleaning. The specification shall apply to the complete powerplant including all components, parts, piping subassemblies, and appurtenances.

(2) Preliminary calculations which establish the tentative thickness of all pressure containing components.

(3) Joint design and methods proposed to assemble powerplant components, parts, piping subassemblies, and appurtenances at the construction site.

(4) Methods to be followed in the detailed stress calculations.

(5) Diagrammatic arrangement drawings of all pressure vessels and piping forming reactor coolant pressure boundary.

(6) When completed, the final design specification and stress reports as required by subsection NA (see NA-3250 and NA-3350) together with the final arrangement drawings shall be forwarded to the Coast Guard (MMT) for review.

(b) Each manufacturer shall comply with NA-3300 and shall have received a Certificate of Authorization from the Society as described in NA-3330, and shall have a Society-Approved Quality Assurance Program as required by NA-8120 prior to fabrication. The containment vessel (Class MC) and piping subassemblies of any class fabricated by the building facility of the vessel are exempted; however, such facilities shall have a Quality Assurance Program meeting NA-4000 accepted by the Coast Guard (MMT).

(c) The installer as used in Section III of the ASME Code is defined as the vessel's building facility. The installer shall comply with NA-3400 except that he need not possess the "NA" Code symbol stamp or Certificate of Authorization from the Society. The installer shall have a Quality Assurance Program meeting the requirements of NA-4000 and shall have it accepted by the Coast Guard (MMT).

(d) Inspection of nuclear power plant components of all classes for installation in vessels subject to inspection under the requirements of this subchapter shall be conducted by a marine inspector (see § 50.10-15 of this subchapter) in lieu of the Code authorized inspector defined in NA-5112, except that pumps, line valves, safety valves, and shop fabricated piping subassemblies which have an appropriate N-type Code symbol stamp (as illustrated in Table NA-3120-1), an appropriate data report as required by NA-8400, and inspection by a Code authorized inspector may also be accepted. The marine inspector at the power plant construction site shall insure that all components, parts, piping subassemblies and appurtenances bear proper stamping and documentation, and that each has been properly assembled into the complete system.

[CGD 72-206R, 38 FR 17227, June 29, 1973]

Subpart 55.10—Class 1 Components[1]

§ 55.10-1 General (modifies subsection NB).

(a) Class 1 components shall meet the requirements of articles NB-1000 through NB-8000 of section III of the ASME Code except as noted otherwise in this subpart.

[CGD 72-206R, 38 FR 17228, June 29, 1973]

§ 55.10-5 Design.

(a) *Additional loadings (modifies NB-3111).* The designer must consider loadings in addition to those listed in NB-3111 of the ASME Code, which are peculiar to the marine application. Loadings which must be determined for each application include but are not limited to—

(1) Loading imposed by vessel's attitude in roll, list, pitch, trim, yaw, sway, surge, and heave;

(2) Dynamic forces due to ship motions;

(3) Loading due to shielding; and

(b) *Foundations and supports.* The designer shall determine the natural frequency of the nuclear pressure vessel in its mode of support, considering the engine and propeller shaft speed, and account for it in the design, and shall investigate the support of other components.

[CGD 72-206R, 38 FR 17228, June 29, 1973]

§ 55.10-20 Welding and fabrication.

(a) *Welding procedure and performance qualification (modifies NB-4300).* Weld procedure and performance qualifications shall be as required by Part 57 of this subchapter and NB-4300 of the ASME Code.

(b) *Production tests (modifies NB-4330).* NB-4330 of the ASME Code is modified by adding the following requirements:

(1) Weld production test plates are required for vessels. These shall meet the requirements of Subpart 57.06 of this subchapter.

(2) In addition to the Charpy V-notch testing required for weld procedure qualification by NB-4335.1 and NB-4335.2 of the ASME Code, Charpy V-notch production toughness tests of the weld metal and heat affected base metal are required for vessels at the same interval as described in Subpart 57.06 of this subchapter for production test plates. The test specimens and testing shall follow the requirements of NB-4335 of the ASME Code.

[72-206R, 38 FR 17228, June 29, 1973]

§ 55.10-25 Quenched and tempered steels.

(a) The requirements of § 57.03-1(d) of this subchapter are applicable to welded vessels of quenched and tempered steels.

§ 55.10-30 Marking and stamping (modifies NA-8000).

(a) Each pressure vessel shall be marked in the presence of a marine inspector at the place of fabrication as follows:

(1) Coast Guard symbol (see § 50.10-25 of this chapter).

(2) Coast Guard number (see § 50.10-30 of this chapter).

(3) The letter N for nuclear.

(4) The letter N for nuclear.

(b) Each pressure vessel part requiring shop inspection which will be furnished by other than the shop of the manufacturer responsible for the completed unit shall be marked in the presence of a marine inspector at the place of fabrication as follows:

(1) Coast Guard symbol (see § 50.10-25 of this chapter).

(2) Marine inspection office identification letters (see § 50.10-30 of this chapter).

(3) The letters PT.

(4) The letter N for nuclear.

(5) The numeral 1 for class 1 nuclear vessel.

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[1] 38 FR 17227, June 29, 1973.

(c) The markings for safety valves, pumps, piping, and line valves shall follow the requirements of NA-8200. For nuclear components and parts which are not inspected by a marine inspector, see § 55.05-1(d).

[CGD FR 69-127, 35 FR 9977, June 17, 1970, as amended by CGD 72-206R, 38 FR 17228, June 29, 1973]

§ 55.10-35 Manufacturers' data reports (modifies NA-8400).

(a) The Manufacturers' data report form, as provided by the Coast Guard, shall be completed in duplicate and certified by the manufacturer for each nuclear pressure vessel required to be shop inspected under these regulations. The original of this form shall be delivered to the Coast Guard inspector.

(b) Data forms for those parts of a nuclear pressure vessel requiring inspection, which are furnished by other than the shop of the manufacturer responsible for the completed unit, shall be executed in triplicate by the manufacturer of the parts. The original and one copy shall be delivered to the Coast Guard inspector who shall forward one copy of the report to the Officer in Charge, Marine Inspection having cognizance over the final assembly. These partial data reports, together with the final inspection and tests, shall be the final Coast Guard inspector's authority to apply the Coast Guard symbol and number. A final data report shall be executed by the manufacturer or assembler who completes the final assembly and tests.

(c) Safety valves, pumps, piping, and line valves which are not inspected by a marine inspector shall meet the requirements of NA-8400 for the completion of the appropriate ASME data report.

[CGFR 69-127, 35 FR 9978, June 17, 1970, as amended by CGD 72-206R, 38 FR 17228, June 29, 1973]

§ 55.10-40 Overpressure protection (modifies NB-7000).

(a) The Overpressure Protection report required by NB-7300 shall be submitted to the Coast Guard for approval.

(b) (Modifies NB-7611, NB-7612, and NB-7640.) Automatic spring-loaded safety valves, and those valves equivalent to automatic spring-loaded safety valves as described in NB-7611, NB-7612, and NB-7640 shall comply with Subpart 162.001 of this chapter in addition to NB-7611, NB-7612, and NB-7640.

(c) (Modifies NB-7613, NB-7620, and NB-7630.) The use of antisimmer-type safety valves, pilot operated pressure relief valves, and power actuated pressure relief valves not equivalent to automatic spring loaded safety valves shall be described in the overpressure protection report and shall be specifically approved by the Commandant. Marking and stamping of valves shall be as described in NB-7900 or, if spring loaded, as required by subpart 162.001 of this chapter.

[CGD 72-206R, 38 FR 17228, June 29, 1973]

Subpart 55.15—Class B Vessels

§ 55.15-1 General (modifies subsection NE).

(a) Containment provided via pressure vessel configuration is not mandatory, but, if utilized, shall meet the requirements of this subpart.

(b) Class MC components shall meet the requirements of subsection NE of section III of the ASME Code except as noted otherwise in this subpart.

[CGD 72-206R, 38 FR 17228, June 29, 1973]

§ 55.15-3 Design (modifies NE-3100).

(a) Treatment of external loadings and supports shall also comply with § 55.10-5.

(b) The containment vessel and its internal components should be designed to remain in place regardless of orientation in the event of the ship sinking.

[CGFR 70-143, 35 FR 19906, Dec. 30, 1970, as amended by CGD 72-206R, 38 FR 17228, June 29, 1973]

§ 55.15-5 Welding and fabrication (modifies NE-4300).

(a) *Weld procedure.* Weld procedure and performance qualification shall follow that for Class 1 components in § 55.10-20(a).

(b) *Production test.* Production tests must meet the requirements of Subpart 57.06 of this subchapter.

(c) *Charpy V-notch testing.* When Charpy V-notch testing is required by NE-4335 of the ASME Code, such testing shall be required for both procedure qualification for all components and for regular production welding for vessels as described in § 55.10-20(b)(2). The test temperature for procedure and production toughness testing shall be as required by NE-2330.

(d) *Quenched and tempered steels.* For vessel constructed of quenched and tempered steels refer to § 57.03-1(d) of this subchapter.

[CGD 72-206R, 38 FR 17228, June 29, 1973]

§ 55.15-10 Stamping and reports (modifies NE-8000).

(a) In addition to the requirements of NE-8100, the requirements of §§ 55.10-30 and 55.10-35 shall be followed for marking, stamping, and data reports.

(b) The letters "MC" shall be used for class designation.

(c) For components other than the containment vessel, refer to § 55.10-30 (c).

[CGD 72-206R, 38 FR 17228, June 29, 1973]

§ 55.15-15 Overpressure and vacuum relief protection (modifies NE-7000).

(a) (*Modifies NE-7116.*) In lieu of the vacuum relief device required by NE-7116, consideration shall be given to designing the containment vessel to remain intact without collapse due to external pressure should sinking occur in a harbor or approach where salvage may be possible. Consideration shall be given to the prevention of pressure vessel crushing in the event of sinking in deep water by relieving external pressure by a method such as flooding. Design proposals shall be submitted to the Coast Guard (MMT) for approval.

(b) (*Modifies N-1710.6.*) In lieu of the vacuum relief device required by N-1710.6, consideration shall be given to designing the containment vessel to remain intact without collapse due to external pressure should sinking occur in a harbor or approach where salvage may be possible. Consideration shall be given to the prevention of pressure vessel crushing in the event of sinking in deep water by relieving external pressure by a method such as flooding.

[CGFR 70-143, 35 FR 19906, Dec. 30, 1970, as amended by CGD 72-206R, 38 FR 17228, June 29, 1973]

Subpart 55.20—Class 2 Components

§ 55.20-1 General (modifies subsection NC).

(a) Class 2 components shall meet the requirements of subsection NC of section III of the ASME Code except as noted otherwise in this subpart.

(b) (Modifies NC-1000.) Class 2 vessels shall be designed, fabricated, inspected, tested, and marked in accordance with the appropriate standards of Part 54 of this subchapter. The requirements of NC-3352 and NC-5200 for vessels shall apply in lieu of the joint design and nondestructive testing requirements of Table 54.01-5(b) of this subchapter. Design based on standards of Division 2 of section VIII of the ASME Code must receive prior approval by the Commandant.

[CGD 72-206R, 38 FR 17228, June 29, 1973]

§ 55.20-5 Weld production testing.

Weld production testing in accordance with Subpart 57.06 of this chapter is required. Class 2 vessels which would otherwise fit the Class III category shall receive the production testing specified for a Class II vessel.

[CGFR 69-127, 35 FR 9978, June 17, 1970, as amended by CGD 72-206R, 38 FR 17228, June 29, 1973]

§ 55.20-10 Overpressure protection.

The requirements of NC-7000 shall apply in lieu of Subpart 54.15 of this subchapter. The overpressure protection analysis (NC-7300) shall be submitted to the Coast Guard (MMT) for review.

[CGD 72-206R, 38 FR 17228, June 29, 1973]

§ 55.20-20 Stampings (modifies NA-8000).

In lieu of the stamping required by NA-8000 of the ASME Code, vessels constructed in accordance with this subpart shall be stamped as required by § 55.10-20 with the addition of the symbols "N2" after the class. For components other than pressure vessels, refer to § 55.100-30(c).

[CGD 72-206R, 38 FR 17228, June 29, 1973]

Subpart 55.25—Class 3 Components

SOURCE: CGD 72-206R, 38 FR 17228, June 29, 1973, unless otherwise noted.

§ 55.25-1 General (modifies subsection ND).

Class 3 components shall meet the requirements of subsection ND except that pressure vessels shall meet the requirements of Part 54 of this subchapter, in lieu of the requirements of subsection ND. However, the installation testing of piping and complete Class 3 nuclear systems shall meet the requirements of ND-6000.

§ 55.25-10 Stamping (modifies NA-8000).

In lieu of the stamping required by NA-8000, pressure vessels constructed in accordance with this subpart shall be stamped as required by § 54.10-20 of this subchapter with the addition of the symbols "N3" after the class. For components other than pressure vessels, refer to § 55.10-30(c).

PART 56—PIPING SYSTEMS AND APPURTENANCES

Subpart 56.01—General

Sec.

56.01-1 Scope (replaces 100.1).
56.01-3 Power boiler external piping (Replaces 100.1.1, 100.1.2, 102.4.7, 111.6, 122.1, 132 and 133).
56.01-5 Adoption of ANSI (American National Standards Institute) Code B31.1 for pressure and power piping, and other standards.
56.01-6 Adoption of other standards and specifications.
56.01-10 Plan approval.

Subpart 56.04—Piping Classification

56.04-1 Scope.
56.04-2 Piping classification according to service.
56.04-10 Other systems.

Subpart 56.07—Design

56.07-5 Definitions (modifies 100.2).

Sec.

56.07-10 Design conditions and criteria (modifies 101 through 104.7).

Subpart 56.10—Components

56.10-1 Selection and limitations of piping components (replaces 105 through 108).
56.10-5 Pipe.

Subpart 56.15—Fittings, Bends and Intersections

56.15-1 Fittings.

Subpart 56.20—Valves

56.20-1 General.
56.20-5 Marking (reproduces 107.2).
56.20-7 Ends.
56.20-9 Valve construction.
56.20-15 Valves employing resilient material.
56.20-20 Valve bypasses.

Subpart 56.25—Pipe Flanges, Blanks, Flange Facings, Gaskets, and Bolting

56.25-5 Flanges.
56.25-7 Blanks.
56.25-10 Flange facings.
56.25-15 Gaskets (reproduces 108.4).
56.25-20 Bolting.

Subpart 56.30—Selection and Limitations of Piping Joints

56.30-1 Scope (replaces 110 through 118).
56.30-3 Piping joints (reproduces 110).
56.30-5 Welded joints.
56.30-10 Flanged joints (modifies 104.5.1 (a)).
56.30-15 Expanded or rolled joints.
56.30-20 Screwed joints.
56.30-25 Flared, flareless and compression joints.
56.30-27 Caulked joints.
56.30-30 Brazed joints.
56.30-35 Sleeve coupled and other proprietary joints.
56.30-40 Flexible pipe couplings of the compression or slip-on type.

Subpart 56.35—Expansion, Flexibility and Supports

56.35-1 Pipe stress calculations (replaces 119.7).
56.35-10 Bellows expansion joints below 15 pounds per square inch (replaces 119.5.1).
56.35-15 Bellows expansion joints above 15 pounds per square inch (replaces 119.5.1).
56.35-35 Other joints providing flexibility (replaces 119.5.1).

Subpart 56.50—Design Requirements Pertaining to Specific Systems

Sec.
56.50-1 General (replaces 122.6 through 122.10).
56.50-5 Systems conveying oil.
56.50-10 Special gaging requirements.
56.50-15 Steam and exhaust piping.
56.50-20 Pressure relief piping.
56.50-25 Safety and relief valve escape piping.
56.50-30 Boiler feed piping.
56.50-35 Condensate pumps.
56.50-40 Blowoff piping (replaces 102.2.5 (d)).
56.50-45 Circulating pumps.
56.50-50 Bilge and ballast piping.
56.50-55 Bilge pumps.
56.50-60 Cargo oil systems and fuel oil systems for boilers and internal combustion engines; transfer systems, and general arrangement.
56.50-65 Boiler fuel oil service systems.
56.50-70 Gasoline fuel systems.
56.50-75 Diesel fuel systems.
56.50-80 Lubricating oil system.
56.50-85 Tank vent piping.
56.50-90 Sounding devices.
56.50-95 Overboard discharges and shell connections.
56.50-96 Keel cooler installations.
56.50-97 Instrument, control and sampling piping (modifies 122.3).
56.50-100 Fluid power and control systems (hydraulic and pneumatic).
56.50-101 Refrigeration systems.
56.50-102 Liquefied petroleum gas for cooking and heating.
56.50-105 Low temperature piping.
56.50-110 Diving support systems.

Subpart 56.60—Materials

56.60-1 Acceptable materials and specifications (replaces § 123 and modifies Table 126.1 in ANSI-B31.1).
56.60-2 Limitations on materials.
56.60-3 Ferrous materials.
56.60-5 Steel (High temperature applications).
56.60-10 Cast iron and malleable iron.
56.60-15 Ductile iron.
56.60-20 Nonferrous materials.
56.60-25 Nonmetallic materials.

Subpart 56.65—Fabrication, Assembly and Erection

56.65-1 General (replaces 127 through 135.4).

Subpart 56.70—Welding

56.70-1 General.
56.70-3 Limitations.
56.70-5 Material.
Sec.
56.70-10 Preparation (reproduces 127.3).
56.70-15 Procedure.
56.70-20 Qualification, general.

Subpart 56.75—Brazing

56.75-5 Filler metal.
56.75-10 Joint clearance (reproduces 128.2.2).
56.75-15 Heating (reproduces 128.2.3).
56.75-20 Brazing qualification.
56.75-25 Detail requirements.
56.75-30 Pipe joining details.

Subpart 56.80—Bending and Forming

56.80-5 Bending.
56.80-10 Forming (reproduces 129.2).
56.80-15 Heat treatment of bends and formed components.

Subpart 56.85—Heat Treatment of Welds

56.85-5 Heating and cooling method (reproduces 131.1).
56.85-10 Preheating.
56.85-15 Postheat treatment.

Subpart 56.90—Assembly

56.90-1 General.
56.90-5 Bolting procedure.
56.90-10 Threaded piping (reproduces 135.4).

Subpart 56.95—Inspection

56.95-1 General (replaces 136).
56.95-5 Rights of access of marine inspectors.
56.95-10 Type and extent of examination required.

Subpart 56.97—Pressure Tests

56.97-1 General (replaces 137).
56.97-5 Pressure testing of nonstandard piping system components.
56.97-25 Preparation for testing (Reproduces 137.3).
56.97-30 Hydrostatic tests (Reproduces 137.4).
56.97-35 Pneumatic tests (Replaces 137.5).
56.97-38 Initial service leak tess (Reproduces 137.7).
56.97-40 Installation tests.

AUTHORITY: R.S. 4405, as amended, 4462, as amended, sec. 633, 63 Stat. 545, sec. 6(b)(1), 80 Stat. 938; 46 U.S.C. 375, 416, 14 U.S.C. 633, 49 U.S.C. 1655(b), 49 CFR 1.4(a)(2), (f). R.S. 4417, as amended, 4417a, as amended, 4418, as amended, 4426-4431, as amended, 4433, as amended, 4434, as amended, 4488, as amended, 4491, as amended, sec. 14, 29 Stat. 690, as amended, sec. 10, 35 Stat. 428, as amended, 41 Stat. 305, as amended, secs. 1, 2, 49 Stat. 1544, 1545, as amended, sec. 17, 54 Stat. 166, as amended, sec. 3, 54 Stat. 347, as amended, sec. 3, 70 Stat. 152, sec. 3, 68 Stat. 675; 46 U.S.C. 391, 391a, 392, 404–409, 411, 412, 481, 489, 366, 395, 363, 367, 526p, 1333, 390b, 50 U.S.C. 198; E.O. 11239, July 31, 1965, 30 FR 9671, 3 CFR 1965 Supp., unless otherwise noted.

SOURCE: CGFR 68-82, 33 FR 18843, Dec. 18, 1968, unless otherwise noted.

Subpart 56.01—General

NOTE: See § 50.15–10 for general adoption of standards of the ANSI (American National Standards Institute). The printing of portions of the "American National Standard Code for Pressure Piping, Power Piping," ANSI-B31.1, is with the permission of the publisher, The American Society of Mechanical Engineers, United Engineering Center, 345 East 47th Street, New York, N.Y. 10017. The adoption of this standard USAS-B31.1 for pressure piping and power piping is subject to specific limitations or modifications as described in this part. Those requirements in ANSI-B31.1 which are not referred to in this part are adopted without change. Table 56.01–5(a) sets forth a general reference to various paragraphs in ANSI-B31.1 which are limited, modified, or replaced by regulations in this part.

§ 56.01–1 Scope (replaces 100.1).

(a) This part contains requirements for the various ships' and barges' piping systems and appurtenances.

(b) The respective piping systems installed on ships and barges shall have the necessary pumps, valves, regulation valves, safety valves, relief valves, flanges, fittings, pressure gages, liquid level indicators, thermometers, etc., for safe and efficient operation of the vessel.

(c) Piping for industrial systems on mobile offshore drilling units need not fully comply with the requirements of this part but must meet Subpart 58.60 of this subchapter.

(Sec. 2, 87 Stat. 418 (46 U.S.C. 86); sec. 3.82 Stat. 341, as amended (46 U.S.C. 367); R.S. 4405, as amended (46 U.S.C. 375); sec. 10, 35 Stat. 428 (46 U.S.C. 395); R.S. 4423, as amended (46 U.S.C. 400); R.S. 4429, as amended (46 U.S.C. 407); R.S. 4430, as amended (46 U.S.C. 408); 88 Stat. 423 (46 U.S.C. 411); R.S. 4434, as amended (46 U.S.C. 412); R.S. 4462, as amended (46 U.S.C. 416); sec. 1, 73 Stat. 475 (46 U.S.C. 481); sec. 4, 67 Stat. 462 (43 U.S.C. 1333(d)); sec. 6(b)(1), 80 Stat. 937 (49 U.S.C. 1655 (b)(1)); 409 CFR 1.46 (b) and (n)(6))

[CGFR 68-82, 33 FR 18843, Dec. 18, 1968, as amended by CGD 73-251, 43 FR 56799, Dec. 4, 1978]

§ 56.01–3 Power boiler external piping (Replaces 100.1.1, 100.1.2, 102.4.7, 111.6, 122.1, 132 and 133).

(a) Piping system components associated with power boilers are covered by the requirements of this part and §§ 52.01–105, 52.01–110, 52.01–115, and 52.01–120.

(b) Specific requirements for power boiler external piping and appurtenances, as defined in §§ 100.1.1 and 100.1.2, appearing in the various paragraphs of ANSI-B31.1, are, therefore, not adopted unless otherwise specifically indicated elsewhere in this part.

[CGD 73-254, 40 FR 40164, Sept. 2, 1975]

§ 56.01–5 Adoption of ANSI (American National Standards Institute) Code B31.1 for pressure and power piping, and other standards.

(a) Piping systems for ships and barges shall be designed, constructed, and inspected in accordance with B31.1, the "Code for Pressure Piping, Power Piping," of the ANSI (American National Standards Institute), as limited, modified, or replaced by specific requirements in this part. The provisions in the appendices to ANSI-B31.1 are adopted and shall be followed when the requirements in ANSI-B31.1 or the regulations in this part make them mandatory. For general information Table 56.01–5(a) lists the various paragraphs, etc., in ANSI-B31.1 which are limited, modified, replaced, or reproduced by regulations in this part.

TABLE 56.01–5(a)—LIMITATIONS AND MODIFICATIONS IN THE ADOPTION OF ANSI-B31.1 CODE FOR PRESSURE AND POWER PIPING

Section or paragraph in ANSI-B31.1, and disposition	Unit in this part
100.1 replaced by	56.01–1.
100.2 modified by	56.07–5.
101 through 104.7 modified by	56.07–10.
101.2 modified by	56.07–10(a), (b).
101.5 replaced by	56.07–10(c).
102.2 modified by	56.07–10(d).
102.2.5(d) replaced by	56.50–40.
102.3 and 104.1.2 modified by	56.07–10(e).

TABLE 56.01-5(a)—LIMITATIONS AND MODIFICATIONS IN THE ADOPTION OF ANSI-B31.1 CODE FOR PRESSURE AND POWER PIPING—Continued

Section or paragraph in ANSI-B31.1, and disposition	Unit in this part
104.3 modified by	56.07-10(f).
104.4 modified by	56.07-10(e).
104.5.1 modified by	56.30-10.
105 through 108 replaced by	56.10-1 through 56.25-20.
110 through 118 replaced by	56.30-1 through 56.30-35.
119.5.1 replaced by	56.35-10, 56.35-15, 56.35-35.
119.7 replaced by	56.35-1.
122.3 modified by	56.50-97.
122.6 through 122.10 replaced by	56.50-1 through 56.50-80.
123 replaced by	56.60-1.
Table 126.1 modified by	56.30-5(c)(3), 56.60-1.
127 through 135.4 replaced by	56.65-1, 56.70-1 through 56.90-10.
136 replaced by	56.95-1 through 56.95-10.
137 replaced by	56.97-1 through 56.97-40.

(b) When a section or paragraph of the regulations in this part relates to material in ANSI-B31.1 Code (American National Standard Code for Pressure Piping, Power Piping), the relationship with this code will be shown immediately following the heading of the section or at the beginning of the paragraph as follows:

(1) (Modifies ———.) This indicates that the material in the ANSI-B31.1 so numbered for identification is generally applicable but is being altered, amplified or augmented.

(2) (Replaces ———.) This indicates that the material in the ANSI-B31.1 so numbered for identification does not apply.

(3) (Reproduces ———.) This indicates that the material in the ANSI-B31.1 so numbered for identification is being identically reproduced for convenience, not for emphasis.

(c) As stated in § 50.15-10 of this chapter, the standards of the ANSI (American National Standards Institute) specifically referred to in this part shall be the governing requirements for the subject matters covered unless specifically limited, modified or replaced by other regulations in this subchapter. See § 56.60-1(b) for the other adopted commercial standards applicable to piping systems which also form a part of this subchapter.

(Sec. 552, 80 Stat. 383, as amended; 5 U.S.C. 552)

[CGFR 68-82, 33 FR 18843, Dec. 18, 1968, as amended by CGFR 69-127, 35 FR 9978, June 17, 1970; CGFR 72-59R, 37 FR 6189, Mar. 25, 1972; CGD 73-254, 40 FR 40164, Sept. 2, 1975]

§ 56.01-6 Adoption of other standards and specifications.

(a) *General.* As stated in Subpart 50.15 of this subchapter, the standards and specifications specifically referred to in this part shall be the governing requirements for the subjects covered unless specifically limited, modified, or replaced by other regulations in this subchapter.

(b) *American Society of Mechanical Engineers.* The portions of the ASME (American Society of Mechanical Engineers) Code as referenced in this part are adopted and form a part of this subchapter.

(c) *American Society of Testing Materials.* (1) The ASTM specifications as referenced in this part are adopted and form a part of this subchapter.

(2) The following specifications of the American Society of Testing Materials have been specifically disapproved for certain purposes:

(i) ASTM A-53, furnace welded pipe, shall not be used for flammable or combustible liquids in machinery spaces (see § 56.10-5(b)).

(ii) ASTM A-72, welded pipe, shall not be used for flammable or combustible liquids in machinery spaces (see § 56.10-5(b)).

(iii) Plate material listed in UCS-6(b), section VIII, ASME Code (see § 56.30-10(b)(5)).

(d) *Manufacturers' Standardization Society (MSS).* See § 56.60-1(b) for other adopted commercial standards of the Manufacturers' Standardization Society applicable to piping systems.

(Sec. 552, 80 Stat. 383; 5 U.S.C. 552)

[CGFR 68-82, 33 FR 18843, Dec. 18, 1968, as amended by CGFR 69-127, 35 FR 9979, June 17, 1970]

§ 56.01-10 Plan approval.

(a) Plans and specifications for new construction and major alterations showing the respective piping systems shall be submitted, as required by Subpart 50.20 of this subchapter.

(b) Piping materials and appliances, such as pipe, tubing, fittings, flanges, and valves, except safety valves and safety relief valves covered in Part 162 of Subchapter Q (Specifications) of this chapter, are not required to be specifically approved by the Commandant, but shall comply with the applicable requirements for materials, construction, markings, and testing. These materials and appliances shall be certified as described in Part 50 of this subchapter. Drawings listing material specifications and showing details of welded joints for pressure-containing appurtenances of welded construction shall be submitted in accordance with paragraph (a) of this section.

(c)(1) Prior to installation aboard ship, diagrams of the following systems shall be submitted for approval:

(i) Steam and exhaust piping.

(ii) Boiler feed and blowoff piping.

(iii) Safety valve escape piping.

(iv) Fuel oil service, transfer and filling piping. (Service includes boiler fuel and internal combustion engine fuel piping.)

(v) Fire extinguishing systems including fire main and sprinkler piping, inert gas and foam.

(vi) Bilge and ballast piping.

(vii) Salt water tank cleaning piping.

(viii) Condenser circulating water piping.

(ix) Vent, sound and overflow piping.

(x) Sanitary drains, soil drains, deck drains, and overboard discharge piping.

(xi) Internal combustion engine exhaust piping. (Refer to Part 58 of this subchapter for requirements.)

(xii) Cargo piping.

(xiii) Hot water heating systems where the temperature is greater than 250° F. but is less than 375° F.

(xiv) Compressed air piping.

(xv) Fluid power and control systems (hydraulic, pneumatic). (Refer to Subpart 58.30 of this subchapter for specific requirements.)

(xvi) Lubricating oil piping.

(xvii) Refrigeration and air conditioning piping. (Refer to Part 58 of this subchapter for specific requirements.)

(xviii) Nuclear systems.

(2) Arrangement drawings of the following systems shall also be submitted prior to installation:

(i) All Classes I, I-L, and II-L systems.

(ii) All nuclear piping systems.

(iii) All Class II firemain, foam, sprinkler, bilge and ballast, vent sounding and overflow systems.

(iv) Other Class II systems only if specifically requested or required by regulations in this subchapter.

(d)(1) The drawings or diagrams shall include a list of material, furnishing pipe diameters, wall thicknesses, design pressure, fluid temperature, applicable ASTM material or ANSI component specification, type, size, design standard, and rating of valves, flanges, and fittings.

(2) Pump rated capacity and pump shutoff head shall appear on piping diagrams. Pump characteristic curves shall be submitted for all pumps in the firemain and foam systems. These curves need not be submitted if the following information is shown on the drawing:

(i) Rated capacity and head at rated capacity.

(ii) Shutoff head.

(iii) Head at 150 percent rated capacity.

(3) Standard drawings of the following fabrication details shall be submitted:

(i) Welding details for piping connections.

(ii) Welding details for nonstandard fittings (when appropriate).

(d-1) Plans of piping for industrial systems on mobile offshore drilling units must be submitted under Subpart 58.60 of this subchapter.

(e) Where piping passes through watertight bulkheads and/or fire boundaries, plans of typical details of piping penetrations shall be submitted.

(Sec. 2, 87 Stat. 418 (46 U.S.C. 86); sec. 3, 82 Stat. 341, as amended (46 U.S.C. 367); R.S. 4405, as amended (46 U.S.C. 375); sec. 10, 35 Stat. 428 (46 U.S.C. 395); R.S. 4423, as amended (46 U.S.C. 400); R.S. 4429, as amended (46 U.S.C. 407); R.S. 4430, as amended (46 U.S.C. 408); 88 Stat. 423 (46 U.S.C. 411); R.S. 4434, as amended (46

U.S.C. 412); R.S. 4462, as amended (46 U.S.C. 416); sec. 1, 73 Stat. 475 (46 U.S.C. 481); sec. 4, 67 Stat. 462 (43 U.S.C. 1333(d)); sec. 6(b)(1), 80 Stat. 937 (49 U.S.C. 1655(b)(1)); 49 CFR 1.46(b) and (n)(6))

[CGFR 68-82, 33 FR 18843, Dec. 18, 1968, as amended by CGFR 69-127, 35 FR 9978, June 17, 1970; CGFR 72-59R, 37 FR 6189, Mar. 25, 1972; CGD 73-251, 43 FR 56799, Dec. 4, 1978]

Subpart 56.04—Piping Classification

§ 56.04-1 Scope.

Piping shall be classified as shown in Table 56.04-1.

TABLE 56.04-1—PIPING CLASSIFICATIONS

Service	Class	Section in this part
Normal	I, II	56.04-2
Low temperature	I-L, II-L	56.50-105
Nuclear	See Part 55 of this subchapter 5.	

[CGD 72-206R, 38 FR 17229, June 29, 1973]

§ 56.04-2 Piping classification according to service.

The designation of classes according to service is found in Table 56.04-2.

TABLE 56.04-2—PRESSURE PIPING CLASSIFICATION

Service	Class [1]	Pressure (p.s.i.g.)		Temp. (°F)
Class B and C poisons [2]	I	any	and	0 and above.
	I-L	any	and	below 0.
	II	(3)	(3)	(3)
	II-L	(3)	(3)	(3)
Gases and vapors [2]	I	above 150	or	above 650.
	I-L	above 150	and	below 0.
	II	150 and below	and	0 to 650.
	II-L	150 and below	and	below 0.
Liquefied flammable gases [2]	I	above 150	and	0 and above. [1]
	I-L	above 150	and	below 0.
	II	150 and below	and	0 and above.
	II-L	150 and below	and	below 0.
Molten sulphur	I	above 225	or	above 330.
	II	225 and below	and	330 and below.
Cargo liquids Grades A through D [2]	I	above 225	or	above 150.
	I-L	above 225	and	below 0.
	II	225 and below	and	0 to 150.
	II-L	225 and below	and	below 0.
Cargo liquids Grade E	I	above 225	or	above 400.
	I-L	above 225	and	below 0.
	II	225 and below	and	0 to 400.
	II-L	225 and below	and	below 0.
Water	I	above 225	or	above 350.
	II	225 and below	and	350 and below.
Fuels (Bunker, diesel, gasoline, etc.)	I	above 150	or	above 150.
	II	150 and below	and	150 and below.
Lubricating oil	I	above 225	or	above 400.
	II	225 and below	and	400 and below.
Asphalt	I	above 225	or	above 400.
	II	225 and below	and	400 and below.
Heat transfer oil	I	above 225	or	above 400.
	II	225 and below	and	400 and below.
Hydraulic fluid	I	above 225	or	above 400.
	II	225 and below	and	400 and below.

Flammable or combustible dangerous cargoes. Refer to specific requirements of Part 40 of this chapter.
Other dangerous cargoes. Refer to specific requirements of Part 98 of this chapter.

[1] Where doubt exists as to proper classification, refer to the Commandant for resolution.

[2] For definitions, see 46 CFR Parts 30, 151, and 154. Note that the category "B and C" poisons is not used in the rules applying to self-propelled vessels (46 CFR Part 153).

[3] Not permitted except inside cargo tanks approved for Class B and C poisons.

[CGFR 68-82, 33 FR 18843, Dec. 18, 1968, as amended by CGD 73-254, 40 FR 40164, Sept. 2, 1975; CGD 73-96, 42 FR 49024, Sept. 26, 1977]

§ 56.04-10 Other systems.

Material used in other systems not requiring approval shall be acceptable to the marine inspector and shall meet normal commercial standards for the service intended.

Subpart 56.07—Design

§ 56.07-5 Definitions (modifies 100.2).

(a) *Piping.* The definitions contained in 100.2 of ANSI-B31.1 apply, as well as the following:

(1) The word "piping" within the meaning of the regulations in this subchapter refers to fabricated pipes or tubes with flanges and fittings attached, for use in the conveyance of vapors, gases or liquids, regardless of whether the diameter is measured on the inside or the outside.

(b) *Nominal diameter.* The term "nominal diameter" or "diameter" as used in this part, means the commercial diameter of the piping, i.e., pipe size.

(c) *Schedule.* The word "Schedule" when used in this part refers to specific values as given in American National Standards B36.10 and B36.19.

(d) *Fittings and appurtenances.* The word "fitting" and the phrase "fittings and appurtenances" within the meaning of the regulations in this subchapter refer to pressure containing piping system components other than valves and pipe. This includes piping system components whose function is to join branches of the system (such as tees, wyes, elbows, unions, bushings, etc.) which are referred to as pipe joining fittings, as well as components which operate on the fluid contained in the system (such as traps, drains, strainers, separators, filters, meters, etc.), which are referred to as "fluid conditioner" fittings. Thermometer wells and other similar fittings which form part of the pressure barrier of any system are included under this heading. Expansion joints, slip joints, rotary joints, quick disconnect couplings, etc., are referred to as special purpose fittings, and may be subject to such special design and testing requirements as prescribed by the Commandant. Refer to Subpart 56.15 for design requirements for fittings.

(e) *Nonstandard fittings.* A "nonstandard fittings" is a component of a piping system which is not fabricated under the approved industry, ASTM, or American National Standards for pipe, tubing, flanges, valves, pipe joining fittings, fluid conditioner fittings or special purpose fittings. Where such standards are not available or are not used, components are considered nonstandard and may be utilized if the requirements of § 56.15-1 are met.

[CGFR 68-82, 33 FR 18843, Dec. 18, 1968, as amended by CGFR 69-127, 35 FR 9978, June 17, 1970]

§ 56.07-10 Design conditions and criteria (modifies 101 through 104.7).

(a) *Maximum allowable working pressure (modifies 101.2).* (1) The maximum allowable working pressure of a piping system shall not be greater than the internal design pressure defined in 104.1.2 of ANSI-B31.1.

(2) Where the maximum allowable working pressure of a system component, such as a valve or a fitting, is less than that computed for the pipe or tubing, the system pressure shall be limited to the lowest of the component maximum allowable working pressures.

(b) *Relief valves (modifies 101.2).* (1) Every system which may be exposed to pressures higher than the system's maximum allowable working pressure shall be safeguarded by appropriate relief devices. (See § 52.01-3 of this subchapter for definitions.) Relief valves are required at pump discharges except for centrifugal pumps so designed and applied that a pressure in excess of the maximum allowable working pressure for the system cannot be developed.

(2) The relief valve setting shall not exceed the maximum allowable working pressure of the system. Its relieving capacity shall be sufficient to prevent the pressure from rising more than 20 percent above the system maximum allowable working pressure. The rated relieving capacity of safety and relief valves used in the protection of piping systems only shall be based on actual flow test data and the capacity shall be certified by the manufac-

turer at 120 percent of the set pressure of the valve.

(3) Relief valves shall be certified as required in Part 50 of this subchapter for valves, and shall also meet the requirements of § 54.15-10 of this subchapter.

(c) *Dynamic effects* (*replaces 101.5*). In Class I, I-L, II-L and nuclear piping systems, where the effect of shipboard motions are taken into account, including the effects of impact or collision, weight, roll, sway, yaw, pitch and heave, and vibration, and additional nondestructive testing that provides 100 percent volumetric examination of the material (e.g. Supplemental Requirement S6.1 to ASTM-A376 for ultrasonics or other forms of nondestructive examination as specified by the Commandant) is accomplished, the maximum allowable stress permitted will be that which may be found from Table 56.60-1(a). Where these factors are not considered for such systems, the maximum allowable stress will be 80 percent of the tabulated value for all materials.

(d) *Pressure temperature ratings* (*modifies 102.2*). The material in 102.2 of ANSI-B31.1 is applicable with the following exceptions:

(1) The details of components not having specific ratings as described in 102.2 shall be furnished to the Commandant for approval.

(2) Boiler blowoff piping shall be designed in accordance with § 56.50-40 in lieu of 102.5(d).

(e) *Pressure design* (*modifies 102.3, 104.1.2, and 104.4*). Materials for use in piping systems shall be selected from Table 56.60-1(a) or 56.60-2(a). Tabulated allowable stress values for these materials shall be taken as indicated in 102.3.1 of ANSI-B31.1, Table 56.60-1(a) and 56.60-2(a). Allowable stress values as found in the ASME Code which are restricted in application by footnote or which are italicized shall not be used. Where multiple stresses are listed for a material, the lowest value of the listing shall be used unless otherwise approved by the Commandant. In all cases the temperature is understood to be the actual temperature of the component. Where it is desired to use a material not listed, permission must be obtained from the Commandant. For Class I, I-L, II-L and nuclear piping systems the values of stress (S_c, S_h, SE) as used in equations appearing in 102.3.2, 104.1.2, and 104.4 of ANSI-B31.1 are to be limited to 80 percent of the tabulated values if the dynamic effects are not considered and additional material inspection is not accomplished as per paragraph (c) of this section. Requirements for testing found in § 56.97-40(a)(2) and (4) may affect design and should be considered. Special design limitations may be found for specific systems. Refer to Subpart 56.50 for specific requirements.

(f) *Intersections* (*modifies 104.3*). The material of ANSI-B31.1 in 104.3 is applicable with the following additions:

(1) Reinforcement calculations where applicable shall be submitted.

(2) Wherever possible the longitudinal joint of a welded pipe should not be pierced.

[CGFR 68-82, 33 FR 18843, Dec. 18, 1968, as amended by CGFR 69-127, 35 FR 9978, June 17, 1970; CGFR 72-59R, 37 FR 6189, Mar. 25, 1972; 37 FR 16803, Aug. 19, 1972; CGD 73-254, 40 FR 40164, Sept. 2, 1975]

Subpart 56.10—Components

§ 56.10-1 Selection and limitations of piping components (replaces 105 through 108).

(a) Pipe, tubing, pipe joining fittings, and piping system components, shall meet material and standard requirements of Subpart 56.60 and shall meet the certification requirements of Part 50 of this subchapter.

(b) The requirements in this subpart and Subparts 56.15 through 56.25 shall be followed in lieu of those in 105 through 108 in ANSI-B31.1; however, certain requirements are marked "reproduced."

[CGFR 68-82, 33 FR 18843, Dec. 18, 1968, as amended by CGFR 69-127, 35 FR 9978, June 17, 1970]

§ 56.10-5 Pipe.

(a) *General.* Pipe and tubing shall be selected as described in Table 56.60-1(a).

(b) *Ferrous pipe.* ASTM Specifications A-53 and A-72 furnace welded pipe shall not be used for flammable or combustible liquids within machinery spaces. (See §§ 30.10-15 and 30.10-22 of Subchapter D (Tank Vessels of this chapter.)

(c) *Nonferrous pipe.* (See also § 56.60-20.) (1) Copper and brass pipe for water and steam service may be used for design pressures up to 250 pounds per square inch and for design temperatures to 406° F.

(2) Copper and brass pipe for air may be used in accordance with the allowable stresses found from Table 56.60-1(a).

(2-a) Copper-nickel alloys may be used for water and steam service within the design stress and temperature limitations indicated in ANSI-B31.1.

(3) Copper tubing may be used for dead-end instrument service up to 1,000 pounds per square inch.

(4) Copper, brass, or aluminum pipe or tube shall not be used for flammable fluids except where specifically permitted by this part.

(5) Aluminum alloy pipe or tube may be used within the limitation stated in 123.2.7 of ANSI-B31.1 and paragraph (4) of this section (c)5.

(d) *Nonmetallic pipe.* (1) Polyvinyl chloride pipe may be used for water, nonflammable chemicals and air service, provided the pressure is limited to 150 pounds per square inch gage and the temperature to 140° F. Other types of plastic pipe may be used in the above services provided that it is demonstrated that the pipe is suitable for the service conditions and is being used within the manufacturer's recommendations for pressure and temperature.

(2) Refer to § 56.60-25(a) for further details on limitations in the uses of nonmetallic pipe.

[CGFR 68-82, 33 FR 18843, Dec. 18, 1968, as amended by CGFR 69-127, 35 FR 9978, June 17, 1970; CGFR 72-59R, 37 FR 6189, Mar. 25, 1972]

Subpart 56.15—Fittings, Bends and Intersections

§ 56.15-1 Fittings.

(a) Screwed, flanged, socket, butt welding, and brazed fittings, made in accordance with the applicable standards in Tables 56.60-1(a) and 56.60-1(b), may be used in piping systems within the material, size, pressure, and temperature limitations of those standards, and within any further limitations specified in this subchapter. Design shall be for the maximum pressure to which they may be subjected, but in no case less than 50 pounds per square inch gage.

(b) Fittings not covered by the standards listed in Table 56.60-1(b) may be used if they conform to paragraphs (c), (d), and (e) of this section and are approved for use by the Commandant. (See the definitions in § 56.07-5(d), (e).) All nonstandard fittings shall be pressure tested by the fabricator following the requirements of § 56.97-5.

(c) Nonstandard special purpose fittings shall meet the requirements of § 56.30-40 or § 56.35-10, as appropriate.

(d) Fabricators of nonstandard pipe joining fittings which are of nonwelded construction may obtain acceptance of their products by following § 50.25-25 of this subchapter. Those which are welded shall follow the procedures of § 50.25-20 of this subchapter. All nonstandard pipe joining fittings of welded construction rated for pressure above 15 pounds per square inch shall be of suitable materials as described in § 56.60-1, shall be marked in accordance with an industry standard (MSS Standard SP-25), and shall comply with the following requirements:

(1) Sizes 3 inches and below and fabricated by welding:

(i) The longitudinal joints of welded fittings may be fabricated by either gas or arc welding.

(ii) The first fitting of each size from the production line and at least one fitting from each lot of 100 or fraction thereof shall be flattened cold until the opposite walls meet without the weld(s) developing any cracks.

(iii) One fitting of each size from each lot of 100 or fraction thereof shall be subjected to a hydrostatic pressure test which shall be not less than that required for a seamless drawn pipe of the same size and thickness produced from equivalent strength material, as determined by the appropriate pipe material specification.

(iv) If this fitting fails to meet the prescribed test in subdivision (ii) or (iii) of this paragraph the entire lot of fittings shall be rejected.

(v) Each fitting shall be pressure tested as prescribed by § 56.97-5.

(2) Sizes above 3 inches and fabricated by welding:

(i) The longitudinal joints of welded pipe fittings shall be fabricated by arc welding.

(ii) For pressures exceeding 150 pounds per square inch, each fitting shall be radiographically examined as specified in Section VIII of the ASME Boiler and Pressure Vessel Code.

(iii) For pressure not exceeding 150 pounds per square inch, the first fitting of each size from the production line and at least one fitting of each size in each lot of 20 or fraction thereof shall be examined by radiography to insure that the welds are of acceptable quality.

(iv) One fitting of each size in each lot of 100 or fraction thereof shall be subjected to a hydrostatic pressure test which shall be not less than that required for a seamless drawn pipe of the same size and thickness produced from equivalent strength material as determined by the appropriate pipe material specification.

(v) If this fitting fails to meet the prescribed test in subdivisions (iii) or (iv) of this paragraph, the entire lot of fittings shall be rejected.

(vi) Each fitting shall be pressure tested as prescribed by § 56.97-5.

(3) Welded joint: Single welded butt joints without the use of backing strip may be employed in the fabrication of pipe fittings of welded construction provided the radiographs indicate that complete penetration is obtained.

(e)(1) Nonstandard fluid conditioner fittings whose internal volume is greater than 1.5 cubic feet or whose internal diameter exceeds 6 inches and which are rated for temperatures or pressures exceeding those specified as minimums for Class I piping systems shall be subject to the requirements for pressure vessels of the appropriate class as found in Part 54 of this subchapter except that stamping and shop inspection are not required. See also § 50.25-35 of this subchapter.

(2) All other nonstandard fluid conditioner fittings shall meet the material requirements of Subpart 56.60, the pressure testing requirements of § 56.97-5 and shall be designed to withstand a burst pressure of four times the rated pressure marked on the component. Acceptable manufacturers of this size and rating of nonstandard fluid conditioner fittings will be listed in CG-190, Equipment Lists. Fabricators will follow the procedure in § 50.25-10 of this subchapter for qualifying for listing. Nonstandard fluid conditioner fittings fabricated by welding will not be listed and fabricators will follow the procedure of § 50.25-20 of this subchapter for acceptance.

(3) Heat exchangers having headers, and tubes are not considered piping system components and shall meet the requirements of Part 54 of this subchapter regardless of size. In the case of brazed boiler steam air heaters, see also § 56.30-30 (b)(1).

(f) The requirements in paragraph (e)(1) of this section shall also apply to those nonstandard fluid conditioner fittings rated above 15 pounds per square inch gage without regard to size if the service involves liquids or gases classed as dangerous (refer to Subchapter N (Dangerous Cargoes) of this chapter).

[CGFR 68-82, 33 FR 18843, Dec. 18, 1968, as amended by CGFR 69-127, 35 FR 9979, June 17, 1970]

Subpart 56.20—Valves

§ 56.20-1 General.

(a) Valves complying with the standards and specifications listed in § 56.60-1 may be used within the specified pressure temperature rating.

(b) Valves not complying with paragraph (a) of this section, such as valves of welded construction, shall be specifically approved by the Commandant for the service intended. Materials for such valves shall be as designated in Table 56.60-1(a) or 56.60-2(a). Testing shall comply with § 56.97-5.

(c) Acceptable manufacturers of valves will be listed in CG-190, Equipment Lists. Fabricators of valves of nonwelded construction will follow the procedure in § 50.25–10 of this subchapter for qualifying for listing. Fabricators of valves of welded construction will not be listed but may have their products accepted by following the procedures in § 50.25–20 of this subchapter.

(d) Where liquid trapped in a closed valve can be heated, and uncontrollable rise in pressure can result, means must be provided in the design, installation and operation of the valve to ensure that the pressure in the valve does not exceed that allowed by this part for the attained temperature. (An example might be a flexible wedge gate valve, installed with the stem horizontal; should the valve be closed while liquid from testing, cleaning or condensation of fluid fills the valve this liquid would be trapped in the bonnet section of the closed valve). Any resulting penetration of the pressure wall of the valve must meet the requirements of this part and of drains in ANSI-B16.5.

[CGFR 68–82, 33 FR 18843, Dec. 18, 1968, as amended by CGD 73–254, 40 FR 40164, Sept. 2, 1975]

§ 56.20–5 Marking (reproduces 107.2).

(a) Each valve shall bear the manufacturer's name or trademark and reference symbol to indicate the service conditions for which the manufacturer guarantees the valve. The marking shall be in accordance with MSS–SP–25.

§ 56.20–7 Ends.

(a) Valves may be used with flanged, threaded, butt welding, socket welding or other ends in accordance with applicable standards as specified in Subpart 56.60.

§ 56.20–9 Valve construction.

(a) Outside screw and yoke design shall be used for valves 3 inches and larger for pressures above 600 pounds per square inch. All valves shall close with a right-hand (clockwise) motion of the handwheels when facing the end of the valve stem. Valves shall be of the rising-stem type preferably with the stem threads external to the valve body. Where operating conditions will not permit such installations, the use of a nonrising stem valve will be permitted, provided indicators are fitted to show clearly whether the valve is opened or closed except where valves are located in tanks.

(b) Valves of Class I piping systems (for restrictions in other classes refer to sections on nuclear and low temperature service), having diameters exceeding 2 inches shall have bolted, pressure seal, or breech lock bonnets and flanged or welding ends, except that socket type welding ends shall not be used where the diameter exceeds 2 inches. For diameters not exceeding 2 inches, screwed union bonnet or bolted bonnet, or bonnetless valves of a type which will positively prevent the stem from screwing out of the body may be employed. Cast iron valves with screwed-in or screwed-over bonnets are prohibited. Union bonnet type cast iron valves shall have the bonnet ring made of steel, bronze, or malleable iron.

(c) Valves shall be designed for the maximum pressure to which they may be subjected, but in no case shall the design pressure be less than 50 pounds per square inch. When butterfly or wafer type resilient seated valves are used for shell connections, the valve bodies shall be designed for the maximum pressure to which they may be subjected, but in no case shall the design pressure be less than 50 pounds per square inch. (Refer also to § 56.20–15(b)(2)(ii).) Large fabricated ballast manifolds connecting lines exceeding 8 inches nominal pipe size shall be designed for a pressure of not less than 25 pounds per square inch.

(d) Disks or disk faces, seats, stems and other wearing parts of valves shall be made of material possessing corrosion and heat-resisting qualities suitable for the service conditions to which they may be subjected.

(e) Plug cocks shall be constructed with satisfactory and positive means of preventing the plug from becoming loosened or removed from the body when the plug is operated. Cocks having plug locking arrangements depending on cotter pins are prohibited.

(f) Cocks shall be marked in a straight line with the body to indicate whether they are open or closed.

(g) Materials forming a portion of the pressure barrier shall comply with the applicable provisions of this part.

(46 U.S.C. 363, 366, 367, 390b, 395, 489, 526p; 49 CFR 1.46(b), 49 CFR 1.46(o)(4), 37 FR 21943)

[CGFR 68-82, 33 FR 18843, Dec. 18, 1968, as amended by CGD 72-57R, 38 FR 10722, May 1, 1973]

§ 56.20-15 Valves employing resilient material.

(a) A valve in which the closure is accomplished by resilient nonmetallic material instead of a metal to metal seat shall comply with the design, material and construction specified for valves in this part.

(b) Valves employing resilient material shall be divided into two categories Category A and Category B.

(1) *Category A valves.* (i) Category A valves are those valves employing resilient material that would continue to provide effective closure of the line and would not allow appreciable leakage from the valve if the resilient material were damaged or destroyed.

(ii) Category A valves may be used in any piping system except as positive shutoff valves required by § 56.50-60(d) for systems subject to internal head pressure from tanks containing flammable, combustible, or hazardous materials, or as otherwise exempted in the regulations in this subchapter.

(2) *Category B valves.* (i) Category B valves are those valves employing resilient material that would not provide effective closure of the line or would permit appreciable leakage from the valve if the resilient material were damaged or destroyed.

(ii) Category B valves may be used in any piping system except in any location in a firemain system; in any location in the bilge system; as the positive closure for any opening in the shell of the vessel; in a position serving as the positive shutoff valve required by § 56.50-60(d) for systems subject to internal head pressure from tanks containing flammable, combustible, or hazardous materials; or as otherwise exempted in the regulations in this subchapter.

§ 56.20-20 Valve bypasses.

(a) Sizes of bypasses shall be in accordance with MSS-SP-45.

(b) Pipe for bypasses should be at least Schedule 80 seamless, and of a material of the same nominal chemical composition and physical properties as that used for the main line. Lesser thickness may be approved depending on the installation and service conditions.

(c) Bypasses may be integral or attached.

Subpart 56.25—Pipe Flanges, Blanks, Flange Facings, Gaskets, and Bolting

§ 56.25-5 Flanges.

(a) Flanges shall conform to the design requirements of the applicable standards of Table 56.60-1(b) or Appendix II, Part A and applicable portions of UA-47 of section VIII of the ASME Code. Plate flanges shall meet the material requirements of § 56.60-1(a) and the requirements of § 56.30-10(b)(5). Flanges may be integral or may be attached to pipe by threading, welding, brazing, or other means within the applicable standards specified in Table 126.1 of ANSI-B31.1, as listed in Table 56.60-1(b) and the requirements of this subpart. For flange facing gasket combinations other than those specified above, calculations shall be submitted indicating that the gaskets will not result in a higher bolt loading or flange moment than for the acceptable configurations.

(b) Acceptable manufacturers of flanges will be listed in CG-190, Equipment Lists. Fabricators of flanges will follow the procedure in § 50.25-10 of this subchapter for qualifying for listing.

(5 U.S.C. 552, 14 U.S.C. 633)

[CGFR 68-82, 33 FR 18843, Dec. 18, 1968, as amended by CGFR 69-127, 35 FR 9979, June 17, 1970; CGD 78-108, 43 FR 46545, Oct. 10, 1978]

§ 56.25-7 Blanks.

(a) Blanks shall conform to the design requirements of 104.5.3 of ANSI-B31.1.

[CGFR 68-82, 33 FR 18843, Dec. 18, 1968, as amended by CGFR 69-127, 35 FR 9978, June 17, 1970]

§ 56.25-10 Flange facings.

(a) Flange facings shall be in accordance with the applicable standards listed in Table 56.60-1(b) and MSS-SP-6.

(b) When bolting 150-pound standard steel flanges to flat face cast iron flanges, the steel flange shall be furnished with a flat face, and bolting shall be in accordance with § 56.25-20. Steel flanges of 300-pound raised face standard may be bolted to 250-pound raised face cast iron with bolting in accordance with § 56.25-20(b).

§ 56.25-15 Gaskets (reproduces 108.4).

(a) Gaskets shall be made of materials which are not injuriously affected by the fluid or by temperature.

(b) Only metallic or asbestos-metallic gaskets may be used on flat or raised face flanges if the expected normal operating pressure exceeds 720 pounds per square inch or the temperature exceeds 750° F. However, compressed sheet asbestos confined gaskets are not limited as to pressures provided the gasket material is suitable for the temperatures.

(c) The use of metal or metal-asbestos gaskets is not limited as to pressure provided the gasket materials are suitable for the maximum fluid temperatures.

§ 56.25-20 Bolting.

(a) *General.* (1) Bolts, nuts, and washers shall comply with applicable standards and specifications listed in Table 126.1 of ANSI-B31.1. Refer to § 56.60-1 for use of other materials. Unless otherwise specified, bolting shall be in accordance with ANSI-B16.5.

(2) Bolts shall extend completely through the nuts.

(3) See § 58.30-15(b) of this subchapter for exceptions on bolting used in fluid power and control systems.

(b) Carbon steel bolts or bolt studs may be used if expected normal operating pressure does not exceed 300 pounds per square inch for water or 250 pounds per square inch for steam and the expected normal operating temperature does not exceed 450° F. Carbon steel bolts shall have American National Standard (ANSI-B18.2) heavy hexagon heads and shall have American National Standard heavy semifinished hexagonal nuts. Carbon steel bolts must have USA Standard (USAS-B 18.2) square or heavy hexagon heads and must have USA Standard heavy, semifinished hexagonal nuts. When 250-pound cast iron flanges are used or when 125-pound cast iron flanges are used with ring gaskets, bolting material shall be carbon steel conforming to ASTM Specification A-307, Grade B.

(c) Alloy steel stud bolts shall be threaded full length, or, if desired, may have reduced shanks of a diameter not less than that at the root of the threads. They shall have American National Standard (ANSI-B18.2) heavy semifinished hexagonal nuts. Headed alloy bolts are not to be used.

(d) All alloy bolts or bolt studs and accompanying nuts are recommended to be threaded in accordance with American National Standard B1.1, Class 2A external threads, and Class 2B internal threads (8-thread series 8UN for 1 inch and larger).

(e) (Reproduces 108.5.6.) Washers, when used under nuts, shall be of forged or rolled steel.

[CGFR 68-82, 33 FR 18843, Dec. 1968, as amended by CGFR 69-127, 35 FR 9978, June 17, 1970; CGFR 72-59R, 37 FR 6189, Mar. 25, 1972]

Subpart 56.30—Selection and Limitations of Piping Joints

§ 56.30-1 Scope (replaces 110 through 118).

(a) The selection and limitation of piping joints shall be as required by this subpart in lieu of requirements in 110 through 118 of ANSI-B31.1; however certain requirements are marked "reproduced" in this subpart.

[CGFR 68-82, 33 FR 18843, Dec. 18, 1968, as amended by CGFR 69-127, 35 FR 9978, June 17, 1970]

§ 56.30-3 Piping joints (reproduces 110).

The type of piping joint used shall be suitable for the design conditions and shall be selected with consideration of joint tightness, mechanical strength and the nature of the fluid handled.

§ 56.30-5 Welded joints.

(a) *General.* Welded joints may be used for materials for which welding procedures, welders, and welding machine operators have been qualified in accordance with Part 57 of this subchapter.

(b) *Butt welds—general.* Butt welds may be made with or without backing or insert rings within the limitations established in § 56.70-15. When the use of backing rings will result in undesirable conditions such as severe stress concentrations, corrosion or erosion, then:

(1) The backing rings shall be removed and the inside of the joint ground smooth, or

(2) The joint shall be welded without backing rings, or

(3) Consumable insert rings shall be used. Commonly used types of butt welding end preparations are shown in ASNI-B16.25.

(4) Restrictions as to the use of backing rings appear for the low temperature and nuclear piping systems and should be checked when designing for these systems.

(c) *Socket welds.* (1) Socket welds shall conform to the requirements specified in ANSI-B16.11, applicable standards listed in Table 126.1 and Figure 127.4.4C in ANSI-B31.1. A gap of approximately one-sixteenth inch between the end of the pipe and the bottom of the socket shall be provided before welding. This may best be provided by bottoming the pipe and backing off slightly prior to tacking.

(2) Socket welds shall not be used where severe erosion or crevice corrosion is expected to occur. Restrictions on the use of socket welds appear in § 56.70-15(d)(3) for Class I service, and in the low temperature and nuclear piping sections and should be checked when designing for these systems. See § 56.70-15(d)(4) for Class II service.

(3) (Reproduces 111.3.3.) Drains and bypasses may be attached to a valve or fitting by socket welding in accordance with the dimensions specified in the applicable standards listed in Table 126.1 of ANSI-B31.1.

(d) *Fillet welds.* Fillet welds shall have minimum dimensions as shown in Figures 127.4.4A, 127.4.4B, and 127.4.4C of ANSI-B31.1. See also § 56.70-15(d)(3) and (4) for applications of fillet welds.

(e) *Seal welds.* Seal welds may be used but shall not be considered as contributing any strength to the joint.

[CGFR 68-82, 33 FR 18843, Dec. 18, 1968, as amended by CGFR 69-127, 35 FR 9978, June 17, 1970]

§ 56.30-10 Flanged joints (modifies 104.5.1(a)).

(a) Flanged or butt-welded joints are required for Classes I, I-N, and I-L piping for nominal diameters exceeding 2 inches, except as otherwise specified in this subchapter.

(b) Flanges shall be attached to pipe by any method shown by Figure 56.30-10(b) or by any additional means, that may be approved by the Commandant. Pressure temperature ratings of the appropriate USA Standard shall not be exceeded.

(1) *Figure 56.30-10(b), Method 1.* Flanges with screwed threads may be used in accordance with the Table in 56.30-20.

(2) *Figure 56.30-10(b), Method 2.* 150-pound and 300-pound low-hubbed flanges with screwed threads plus the addition of a strength fillet weld of the size as shown may be used for Class I piping without diameter limitation for temperatures not exceeding 750° F. The pressure shall not exceed the American National Standards service pressure temperature rating.

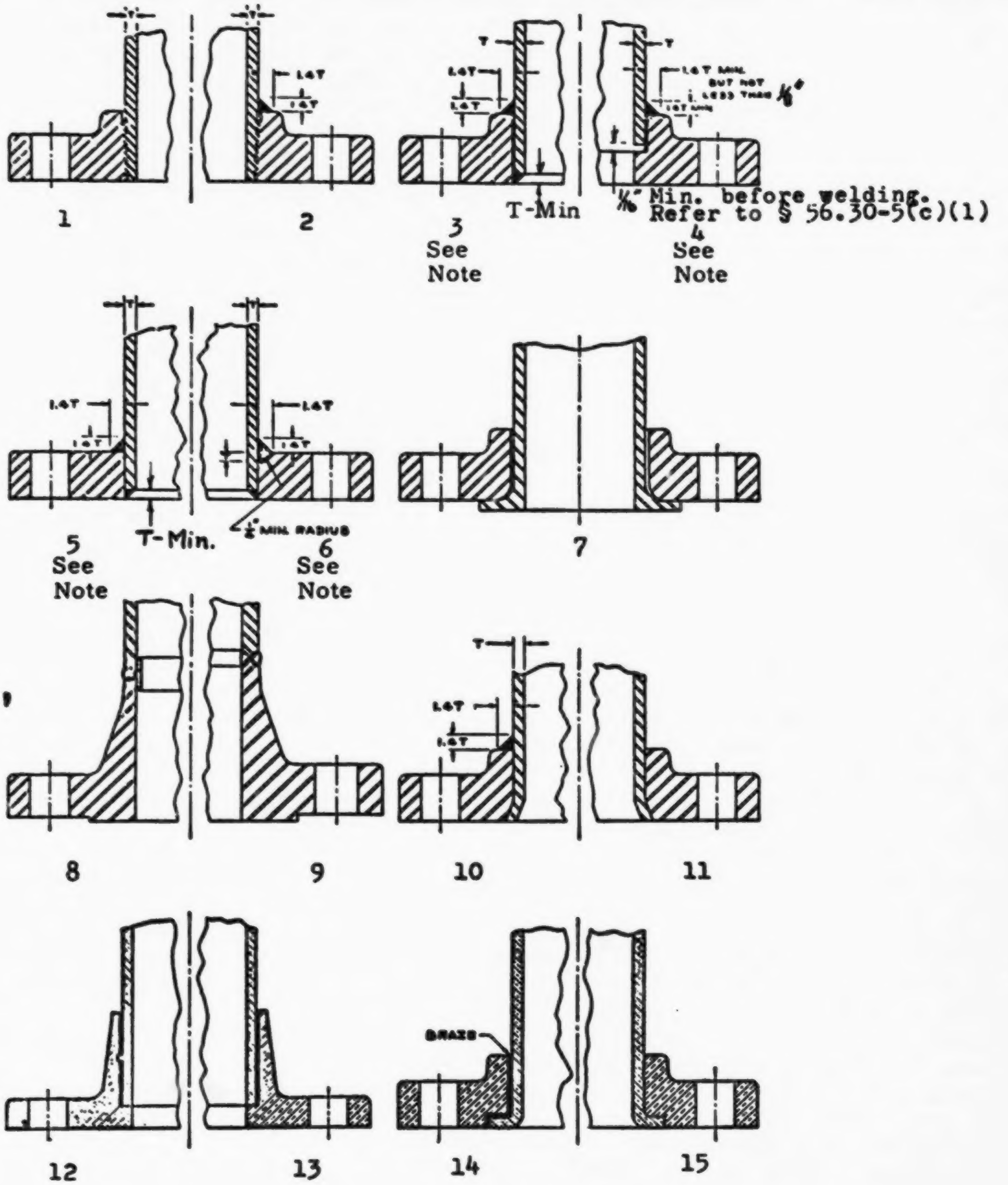
T
1.4T
1.4T MIN. BUT NOT LESS THAN 1/8"
T-Min
1/16" Min. before welding. Refer to § 56.30-5(c)(1)
1
2
3
See Note
4
See Note
T-Min.
1/4" MIN. RADIUS
5
See Note
6
See Note
7
8
9
10
11
BRAZE
12
13
14
15

FIGURE 56.30–10(b)—Methods of attachment.

NOTE: T is nominal pipe wall thickness used. Refer to text in § 56.30–10(b) for modifications on Class II piping systems.

(3) *Figure 56.30–10(b), Method 3.* ANSI-B16.5 slip-on flanges may be used in Class I, Class II, or Class II-L systems not to exceed the service pressure-temperature ratings for the 300-pound and lower classes within the temperature limitations of the material selected for use. In sizes of 3 inches or more when the class of flange is higher than 300 pounds, and whenever full radiography is required by Table 56.95–10 for the class, diameter, and wall thickness of pipe being joined, the use of slip-on flanges is not permitted and a butt weld type connection must be provided. See also Figure 127.4.4(B)(b) of B31.1 utilizing a face and backweld. This configuration may be preferable in those applications where it is desirable to eliminate void

spaces. For Class II piping systems the size of the strength fillet may be limited to a maximum of 0.525 inch instead of 1.4T and the distance from the face of flange to the end of the pipe may be a maximum of three-eighths inch. Restrictions on the use of slip-on flanges appear in the low temperature and nuclear piping sections.

(4) *Figure 56.30-10(b), Method 4.* ANSI-B16.5 socket welding flanges may be used in Classes I, II, or II-L systems not exceeding 3 inches nominal pipe size for the 600-pound and lower classes, and 2½ inches for the 900-pound and 1,500-pound classes within the service pressure-temperature ratings of the standard. In the 3-inch size, whenever full radiography is required by Table 56.95-10 for the class, diameter, and wall thickness of pipe being joined, the use of socket welding flanges is not permitted and a butt weld type connection must be provided. For Class II piping, socket, welding flanges may be used without diameter limitation, and the size of the fillet weld may be limited to a maximum of 0.525 inch instead of 1.4T. Restrictions on the use of socket welds appear in the low temperature and nuclear piping systems and should be checked when designing for these systems.

(5) *Figure 56.30-10(b), Method 5.* Flanges fabricated from steel plate meeting the requirements of Part 54 of this subchapter may be used for Class II piping for pressures not exceeding 150 pounds per square inch and temperatures not exceeding 450° F. Plate material listed in USC-6(b) of section VIII of the ASME Code shall not be used in this application except that material meeting ASTM Specification A-36 may be used. The fabricated flanges shall conform at least to the American National Standard 150-pound flange dimensions. The size of the strength fillet weld may be limited to a maximum of 0.525 inch instead of 1.4T and the distance from the face of the flange to the end of the pipe may be a maximum of three-eights inch.

(6) *Figure 56.30-10(b), Method 6.* Steel plate flanges meeting the material and construction requirements listed in subparagraph (5) of this paragraph may be used for Class II piping for pressures not exceeding 150 pounds per square inch or temperatures not exceeding 650° F. The flange shall be attached to the pipe as shown by Figure 56.30-10(b). Method 6. The pressure shall not exceed the American National Standard Service pressure temperature rating. The size of the strength fillet weld may be limited to a maximum of 0.525 inch instead of 1.4T and the distance from the face of the flange to the end of the pipe may be a maximum of three-eighths inch.

(7) *Figure 56.30-10(b), Method 7.* Lap joint flanges (Van Stone) may be used for Class I and Class II piping. The Van Stone equipment shall be operated by competent personnel. The ends of the pipe shall be heated from 1,650° to 1,900° F. dependent on the size of the pipe prior to the flanging operation. The foregoing temperatures shall be carefully adhered to in order to prevent excess scaling of the pipe. The extra thickness of metal built up in the end of the pipe during the forming operation shall be machined to restore the pipe to its original diameter. The machined surface shall be free from surface defects and the back of the Van Stone lap shall be machined to a fine tool finish to furnish a line contact with the mating surface on the flange for the full circumference as close as possible to the fillet of the flange. The number of heats to be used in forming a flange shall be determined by the size of the pipe and not more than two pushups per heat are permitted. The width of the lap flange shall be at least three times the thickness of the pipe wall and the end of the pipe shall be properly stress relieved after the flanging operation is completed. Manufacturers desiring to produce this type of joint shall demonstrate to a marine inspector that they have the proper equipment and personnel to produce an acceptable joint.

(8) *Figure 56.30-10(b), Method 8.* Welding neck flanges may be used on any piping provided the flanges are butt-welded to the pipe. The joint shall be welded as indicated by Figure 56.30-10(b), Method 8, and a backing ring employed which will permit complete penetration of the weld metal. If a backing ring is not used, refer to § 56.30-5(b) for requirements.

(9) *Figure 56.30–10(b), Method 9.* Welding neck flanges may also be attached to pipe by a double-welded butt joint as shown by Figure 56.30-10(b), Method 9.

(10) *Figure 56.30–10(b), Method 10.* Flanges may be attached by shrinking the flange on to the end of the pipe and flaring the end of the pipe to an angle of not less than 20°. A fillet weld of the size shown by Figure 56.30-10(b), Method 10, shall be used to attach the hub to the pipe. This type of flange is limited to a maximum pressure of 300 pounds per square inch at temperatures not exceeding 500° F.

(11) *Figure 56.30–10(b), Method 11.* The flange of the type described and illustrated by Figure 56.30-10(b), Method 10, except with the fillet weld omitted, may be used for Class II piping for pressures not exceeding 150 pounds per square inch and temperatures not exceeding 450° F.

(12) *Figure 56.30–10(b), Method 12.* High-hub bronze flanges may be used for temperatures not exceeding 425° F. The hub of the flange shall be bored to a depth not less than that required for a threaded connection of the same diameter leaving a shoulder for the pipe to butt against. A preinserted ring of silver brazing alloy having a melting point not less than 1,000° F. and of sufficient quantity to fill the annular clearance between the flange and the pipe shall be inserted in the groove. The pipe shall then be inserted in the flange and sufficient heat applied externally to melt the brazing alloy until it completely fills the clearance between the hub and the flange of the pipe. A suitable flux shall be applied to the surfaces to be joined to produce a satisfactory joint.

(13) *Figure 56.30–10(b), Method 13.* The type of flange as described for Figure 56.30-10(b), Method 12, may be employed and in lieu of an annular groove being machined in the hub of the flange for the preinserted ring of silver brazing alloy, a bevel may be machined on the end of the hub and the silver brazing alloy introduced from the end of the hub to attach the pipe to the flange.

(14) *Figure 56.30–10(b), Method 14.* Flanges may be attached to nonferrous pipe by inserting the pipe in the flange and flanging the end of the pipe into the recess machined in the face of the flange to receive it. The width of the flange shall be not less than three times the pipe wall thickness. In addition, the pipe shall be securely brazed to the wall of the flange.

(15) *Figure 56.30–10(b), Method 15.* The flange of the type described and illustrated by Figure 56.30-10(b), Method 14, except with the brazing omitted, may be used for Class II piping and where the temperature does not exceed 250° F.

[CGFR 68-82, 33 FR 18843, Dec. 18, 1968, as amended by CGFR 69-127, 35 FR 9978, June 17, 1970; CGD 73-254, 40 FR 40164, Sept. 2, 1975]

§ 56.30–15 Expanded or rolled joints.

(a) Expanded or rolled joints may be used where experience or test has demonstrated that the joint is suitable for the design conditions and where adequate provisions are made to prevent separation of the joint. Specific application for use must be made to the Commandant.

§ 56.30–20 Screwed joints.

(a) Screwed joints may be used within the limitations specified in Subpart 56.15 and within the other limitations specified in this section.

(b) (Reproduces 114.1.) All threads on piping components shall be taper pipe threads in accordance with the applicable standard listed in Table 126.1 of ANSI-B31.1. Threads other than taper pipe threads may be used for piping components where tightness of the joint depends on a seal weld or a seating surface other than the threads, and where experience or test has demonstrated that such threads are suitable.

(c) Screwed joints shall not be used where severe erosion, crevice corrosion, shock, or vibration is expected to occur, nor at temperatures over 925° F. Size limits shall be as in Table 56.30-20(c).

(d) Pipe with a wall thickness less than that of standard weight of ANSI-B36.10 steel pipe shall not be threaded, regardless of service. For additional threading limitations for pipe used in steam service over 250 pounds per square inch or water service over 100 pounds per square inch and 200° F., see Part 104.1.2(c)(1) of ANSI-B31.1. Restrictions as to the use of screwed joints appear for low temperature and nuclear piping systems and should be checked when designing for these systems.

TABLE 56.30-20(c)—Threaded Joints [1] [2]

Maximum nominal size, inches	Maximum pressure, p.s.i.g.
Above 2"	(Not permitted in Class I piping service.)
Above 1" up to 2"	600.
Above ¾" up to 1"	1,200.
¾" and below	1,500.

[1] Further restrictions on the use of threaded joints appear in the low temperature and nuclear piping sections.

[2] Size limits are not applicable to hydraulic systems.

[CGFR 68-82, 33 FR 18843, Dec. 18, 1968, as amended by CGFR 69-127, 35 FR 9978, June 17, 1970; CGD 73-254, 40 FR 40164, Sept. 2, 1975]

§ 56.30-25 Flared, flareless and compression joints.

(a) Flared, flareless and compression type tubing fittings may be used for tube sizes not exceeding 2-inch outside diameter within the limitations of applicable standards and specifications listed in Table 126.1 of ANSI-B31.1 as modified by Tables 56.60-1(a) and 56.60-2(a) and as specified in this section.

(b) (Reproduces 115.1.) Fittings and their joints shall be compatible with the tubing with which they are to be used and shall conform to the range of wall thicknesses and method of assembly recommended by the manufacturer.

(c) (Reproduces 115.2.) Fittings shall be used at pressure-temperature ratings not exceeding the recommendations of the manufacturer. Service conditions, such as vibration and thermal cycling shall be considered in the application.

(d) Threads shall be either American National Standard taper pipe threads or Dryseal American National Standard taper pipe threads.

(e) In the absence of standards or specifications, the type of fitting selected shall be adequate and safe for the design conditions in accordance with the following requirements:

(1) The pressure design shall meet the requirements of 104.7 of ANSI-B31.1.

(2) A suitable quantity of the type and size of fittings to be used shall be subjected to performance tests as approved by the Commandant to determine the safety of the joint under simulated service conditions. When vibration, fatigue, cyclic conditions, low temperature, thermal expansion, hydraulic shock, or assembly and disassembly are expected, the applicable conditions shall be incorporated in the test.

(f) Flareless fittings shall be of a design in which the gripping member or sleeve shall grip or bite into the outer surface of the tube with sufficient strength to hold the tube against pressure, but without appreciably distorting the inside tube diameter, or reducing the wall thickness. The gripping member shall also form a pressure seal against the fitting body.

(1) When using bite type fittings a spot check shall be made for adequate depth of bite and condition of tubing by disassembling and reassembling selected joints.

(2) Grip-type fittings that are tightened in accordance with the manufacturers' instructions need not be disassembled for checking. For combustible (§ 30.10-15 of this chapter) fluid service with the exception of hydraulic systems, and for flammable (§ 30.10-22 of this chapter) fluid service with the exception of hydraulic systems, and for flammable (§ 30.10-22 of this chapter) fluid service, flared fitting shall be used except that flare less fittings of the nonbite type may be used when the tubing system is of steel, or nickel copper, or copper nickel alloy. When using copper or copper zinc aloys, flared fittings are §§ 56.50-70 and 56.50-75. In the case of hydraulic systems, flareless fittings of the bite type may be used provided the fittings have been accepted under the provisions of § 50.25-10 of this subchapter.

[CGFR 68-82, 33 FR 18843, Dec. 18, 1968, as amended by CGFR 69-127, 35 FR 9978, June 17, 1970; CGD 72-206R, 38 FR 17229, June 29, 1973]

§ 56.30–27 Caulked joints.

(a) Caulked joint requirements in 118 of ANSI-B31.1 do not apply to marine installations.

[CGFR 68-82, 33 FR 18843, Dec. 18, 1968, as amended by CGFR 69-127, 35 FR 9978, June 17, 1970]

§ 56.30–30 Brazed joints.

(a) *General (refer also to Subpart 56.75).* Brazed socket-type joints shall be made with suitable brazing alloys. The minimum socket depth shall be sufficient for the intended service. Brazing alloy shall either be end-fed into the socket or shall be provided in the form of a preinserted ring in a groove in the socket. The brazing alloy shall be sufficient to fill completely the annular clearance between the socket and the pipe or tube.

(b) *Limitations.* (1) Brazed socket-type joints shall not be used on systems containing flammable or combustible fluids in areas where fire hazards are involved or where the service temperature exceeds 425° F. When specifically approved by the Commandant, brazed construction may be used for service temperatures up to 525° F. in boiler steam air heaters provided the requirements of UB-12 of section VIII of the ASME Code are satisfied at the highest temperature desired.

(2) Brazed joints depending solely upon a fillet, rather than primarily upon brazing material between the pipe and socket are not acceptable.

§ 56.30–35 Sleeve coupled and other proprietary joints.

(a) Coupling type, mechanical gland type and other proprietary joints may be used in certain locations (see § 56.30-40(f) for limitations) where experience or tests have demonstrated that the joint is safe for the operating conditions, and where adequate provision is made to prevent separation of the joint. Use shall be authorized by the Commandant.

§ 56.30–40 Flexible pipe couplings of the compression or slip-on type.

(a) This type of coupling is not suitable for use as a slip type expansion joint because the unit is designed to provide for angular deflection, and does not require the same degree of piping alignment as flanges and threaded couplings. This type of coupling although not designed for axial movement will provide a small amount (approximately ⅜-inch maximum) of such movement because of the elasticity present in the gaskets. To insure that the manufacturer's recommendation on the maximum axial displacement of each coupling is not exceeded, positive restraints affixed to ship's structure shall be included in each installation.

(b) Means should also be provided to prevent the coupling from "creeping" on the pipe and uncovering the joint. Centering rings, when included as part of the coupling, or angle clips welded to the pipe are considered adequate for this purpose. Couplings which have through bolts and a solid sleeve without a centering ring may have a certain number of these bolts elongated and connected to angle clips on one of the pipes. The number of such bolts should be one up to a 4-inch-diameter pipe, two on pipe 4 inches to 10 inches in diameter, and three on larger diameter pipe. Other positive means to prevent creep may be considered, such as machined grooves. Bite type devices are not considered to provide positive protection against creep.

(c) Couplings which employ a solid sleeve with welded attachments on both pipes will require the removal of one set of attachments before dismantling. Rewelding of the attachments may require gas freeing of the line.

(d) The installation shall be such as to preclude appreciable difference in the vibration magnitudes of the pipes joined by the couplings. The couplings shall not be used as a vibration damper. The vibration magnitude and frequency should not exceed that recommended by the coupling manufacturer.

(e) Fabricators of flexible couplings rated above 15 pounds per square inch gage may obtain acceptance of their products by following § 50.25-30 of this subchapter if not welded and § 50.25-20 of this subchapter if welded. Couplings rated below 15 pounds per square inch gage may be accepted if fabricators follow the procedures of § 50.25-10 of this subchapter if not welded and § 50.25-20 of this subchapter if welded.

(f) Flexible couplings must not be used in cargo holds or in any other space where leakage, undetected flooding, or impingement of liquid on vital equipment may disable the ship, or in tanks where the liquid conveyed in the piping system is not compatible with the liquid in the tank. Where flexible couplings are not allowed by this subpart, joints must be screwed, flanged and bolted, or welded.

(g) Damaged or deteriorated gaskets shall not be reinstalled.

(h) Each coupling shall be tested in accordance with § 56.97-5.

[CGFR 68-82, 33 FR 18843, Dec. 18, 1968, as amended by CGFR 72-59R, 37 FR 6189, Mar. 25, 1972]

Subpart 56.35—Expansion, Flexibility and Supports

§ 56.35-1 Pipe stress calculations (replaces 119.7).

(a) A summary of the results of pipe stress calculations for the main and auxiliary steam piping where the design temperatures exceed 800° F., and for the primary piping of nuclear power systems shall be submitted for approval. Calculations shall be made in accordance with one of the recognized methods of stress analysis acceptable to the Commandant to determine the magnitude and direction of the forces and movements at all terminal connections, anchor and junction points, as well as the resultant bending stress, longitudinal pressure stress, torsional stress, and combined expansion stress at all such points. The location of the maximum combined stress shall be indicated in each run of pipe between anchor points.

(b) Special consideration will be given to the use of the full tabulated value of S in computing S_h and S_c where all material used in the system is subjected to additional nondestructive testing as specified by the Commandant, and where the calculations prescribed in 119.6.4 and 102.3.2 of ANSI-B31.1 and § 56.07-10 are performed. The nondestructive testing procedures and method of stress analysis shall be approved by the Commandant prior to the submission of computations and drawings for approval.

[CGFR 68-82, 33 FR 18843, Dec. 18, 1968, as amended by CGFR 69-127, 35 FR 9978, June 17, 1970]

§ 56.35-10 Bellows expansion joints below 15 pounds per square inch (replaces 119.5.1).

(a) Fabricators of bellows type expansion joints rated for a pressure not exceeding 15 pounds per square inch may obtain acceptance of their products by following the procedures of § 50.25-10 of this subchapter if not welded and § 50.25-20 of this subchapter if welded.

§ 56.35-15 Bellows expansion joints above 15 pounds per square inch (replaces 119.5.1).

(a) *Acceptance.* Fabricators of bellows type expansion joints rated for pressures above 15 pounds per square inch gage may obtain acceptance of their products by following the procedures of § 50.25-30 of this subchapter if not welded and § 50.25-20 of this subchapter if welded.

(b) *Drawings and specifications.* Manufacturers desiring approval of a specific model or type of bellows type expansion joint for service above 15 pounds per square inch gage shall submit drawings in quadruplicate showing details of each joint, the material specifications, the total designed deflection, and the design and test pressure and temperature. In particular, details of the method(s) of affixing the flexible member (bellows) to the flanges or pipes is desired. If welding is employed, details of the procedure furnished.

(c) *Preapproval test.* The acceptability of bellows type expansion joints for service above 15 pounds per square inch gage is based upon a cyclic test of a prototype expansion joint indicating it will successfully withstand at least as many cycles, under the conditions of pressure, temperature, axial movement, rotational movement, and transverse movement, as will be encountered in an actual installation. The manufacturer shall submit a Certified Test Report for a prototype of the model or type joint under consideration detailing the test set up, the total number of corrugations, the deflection per corrugation, the internal test pressure and temperature, axial movement, rotational movement, transverse movement, the total cycles at failure, and the location of the failure.

(d) *Approval.* Upon receipt of the Certified Test Report described in paragraph (c) of this section, approval action will be taken. Approval will be granted for each model of expansion joint under consideration, with the approval specifically stating the model number, and nominal pipe size(s), by which the expansion joint may be readily identified. The approval will also state the maximum approved pressure, the corresponding maximum approved temperature, the maximum allowable deflection per corrugation, maximum axial movement, maximum rotational movement, maximum transverse movement, and whether of the self-equalizing or nonequalizing type.

(e) *Approval without submitting test data.* If approval of an entire line or a portion thereof is desired without submitting test data for each model and size, the following information is required:

(1) A detailed procedure for the design of the line of bellows-type expansion joints with total movement, movement per convolution, pressure, temperature, material, number of cycles to failure, and number of convolutions as variables.

(2) Sufficient test data to substantiate the design procedures along with details of the test procedure and mode of failure.

(3) A statement as to the statistical probability of survival of the bellows-type expansion joints under rated conditions. The design procedure shall contain the following provisions and information:

(i) A method of accounting for partial cycles such as those caused in a steam system when temperatures vary from the design maximum. A full cycle is considered to be from a cold plant to maximum temperature and back to a cold plant.

(ii) Listing of maximum total axial movement, maximum total lateral movement and maximum angular movement for each design as a function of size and number of convolutions.

(iii) Listing of maximum rated cold working pressure for each design as a function of size and number of convolutions.

(iv) A listing of unit axial force (pounds per inch), specific shear force (pounds per inch), and unit rotational moment (inch pounds per degree) at the bellows-flange joint for each design as a function of size and number of convolutions.

(v) Stress levels in the bellows if available. Representative drawings of all designs and sizes showing details of the bellows to flange weld shall also be submitted.

(f) *Expansion joints.* For expansion joints of nonmetallic materials see § 56.60-25(e) for specific requirements.

(g) *Testing expansion joints.* Expansion joints shall be tested in accordance with § 56.97-5.

§ 56.35-35 Other joints providing flexibility (replaces 119.5.1).

(a) The joint requirements in this section shall apply in lieu of those in 119.5.1 in ANSI-B31.1.

(b) Joints of the ball, swivel and other types may be used if suitable for expected conditions of pressure, temperature, service, and cyclic life where permitted by the Commandant.

[CGFR 68-82, 33 FR 18843, Dec. 18, 1968, as amended by CGFR 69-127, 35 FR 9978, June 17, 1970]

Subpart 56.50—Design Requirements Pertaining to Specific Systems

§ 56.50-1 General (replaces 122.6 through 122.10).

The piping requirements in this subpart shall apply in lieu of requirements in 122.6 through 122.10 of ANSI-B31.1. Installation requirements applicable to all systems:

(a) Where pipes and scuppers are carried through watertight or oiltight bulkheads, decks or tank tops, or are carried through fire control bulkheads and decks, the integrity of the structure shall be maintained. Lead or other heat sensitive materials shall not be used in piping systems which make such bulkhead or deck penetrations where the deterioration of such systems in the event of fire would impair the integrity of the bulkheads or decks. (For plastic pipe installations, see § 56.60-25(a).) Where plate insert pads are used, bolted connections shall have threads tapped into the plate to a depth of not less than the diameter of the bolt. If welded, the pipe or flange shall be welded to both sides of the plating. Openings in structure through which pipes pass shall be reinforced where necessary. Flanges shall not be bolted to bulkheads so that the plate forms a part of the joint. Metallic materials having a melting point of 1,700° F. or less are considered heat sensitive and if used must be suitably insulated.

(b)(1) Pipes piercing the collision bulkhead shall be fitted with screw-down valves operable from above the bulkhead deck and the valve shall be fitted inside the forepeak tank adjacent to the collision bulkhead. The pipe penetrating the collision bulkhead shall be welded to the bulkhead on both sides. On new installations or replacement in vessels of 150 gross tons and over, the valve body shall be of steel or ductile cast iron.

(2) Passenger vessels shall not have the collision bulkhead pierced below the margin line by more than one pipe conveying liquids in the forepeak tank except that if the forepeak tank is divided to hold two different kinds of liquids, the collision bulkhead may be pierced below the margin line by two pipes, provided there is no practical alternative to the fitting of the second pipe and further provided the safety of the vessel is maintained.

(c) Valves and cocks not forming part of a piping system are not permitted in watertight subdivision bulkheads.

(d) Piping shall not be run over or in the vicinity of switchboards or other electrical equipment if avoidable. When such leads are necessary, welded joints only shall be used and provision shall be made to prevent leakage from damaging the equipment.

(e) Stuffing boxes shall not be used on deep tank bulkheads, double bottoms or in any position where they cannot be easily examined. This requirement does not apply to ore carriers operating on the Great Lakes or cargo lines of oil tankers.

(f) Piping systems shall be installed so that under no condition will the operation of safety or relief valves be impaired.

(g)(1) The use of power actuated valves in systems other than for cargo and fuel oil deep tanks as specified in § 56.50-60, is subject to special consideration by the Commandant. All power actuated valves required in an emergency to operate the vessel's machinery, to maintain its stability, and to operate the bilge and firemain systems shall also be provided with a manual means of operation.

(2)(i) Remote valve controls that are not readily identifiable as to service must be fitted with nameplates.

(ii) Remote valve controls must be accessible under service conditions.

(iii) Remote valve controls, except reach rods, must be fitted with an indicator that shows whether the valve is open or closed.

(iv) Valve reach rods must be adequately protected.

(v) Solid reach rods must be used in tanks containing liquids, except that tank barges having plug cocks inside cargo tanks may have reach rods of extra-heavy pipe with the annular space between the lubricant tube and the pipe wall sealed with a nonsoluble to prevent penetration of the cargo.

(3) Where air operated remote control valves are installed, a self-indicating air cock and a pressure gage or other acceptable means shall be provided in the actuating line to the remote valve as close as possible to the control board to indicate whether the remote control valve is open or closed.

(h) Suitable drains shall be provided at low points of piping systems.

(i) Valves and cocks shall be located so as to be easily accessible and valves or cocks attached to the shell of the vessel or to sea chests located below the floorplating shall be operable from above the floorplates.

(j) When welded fabrication is employed, a sufficient number of detachable joints shall be provided to facilitate overhauling and maintenance of machinery and appurtenances. The joints shall be located so that adequate space is provided for welding, and the location of the welds shall be indicated on the plans.

(k) Piping, including valves, pipe fittings and flanges, conveying vapors, gases or liquids whose temperature exceeds 150° F., shall be suitably insulated where necessary to preclude injury to personnel.

(l) Where pipes are run through cargo spaces they shall be substantially encased to protect them from mechanical injury.

(46 U.S.C. 363, 366, 367, 390b); 49 CFR 1.46(b), 49 CFR 1.46(o)(4) (37 FR 21943))

[CGFR 68-82, 33 FR 18843, Dec. 18, 1968, as amended by CGFR 69-127, 35 FR 9978, June 17, 1970; CGD 72-57R, 38 FR 10722, May 1, 1973]

§ 56.50–5 Systems conveying oil.

(a) Pumps used to transfer oil shall have no discharge connections to firemains, boiler feed systems, or condensers unless approved positive means are provided to prevent oil from being accidentally discharged into any of the aforementioned systems.

(b) Oil piping shall not run through feed or potable tanks nor shall feed or potable water piping pass through oil tanks.

(c) Valves for fuel oil equalizing lines in machinery spaces shall comply with § 56.50–60. Where flooding equalizing cross-connections are required for stability considerations, the arrangement shall be approved by the Commandant.

(d) Piping conveying oil shall be run well away from hot surfaces wherever possible. Where such leads are unavoidable, welded joints only shall be used, or alternatively suitable shields shall be fitted in the way of flanged or mechanical pipe joints when welded joints are not practicable. Where piping, which conveys fuel oil or lube oil to equipment, passes within the proximity of equipment or lines having an open flame or having parts operating above 500° F., the piping must be of seamless steel. (Proximity shall include the distance covered by a jet from the line in question.) (See § 56.50–65.)

(e) Oil piping drains, strainers, and other equipment subject to normal oil leakage shall be fitted with drip pans or other means to prevent oil draining into the bilge.

§ 56.50–10 Special gaging requirements.

(a) Where pressure reducing valves are employed (see 102.2.5(b) of ANSI-B31.1) a pressure gage shall be provided on the low pressure side of the reducing station.

(b) Fuel oil service, fire, cargo and fuel oil transfer and boiler feed pumps must be provided with a pressure gage on the discharge side of the pump. Additional information pertaining to fire pumps is in § 34.10–5 of Subchapter D (Tank Vessels), § 76.10–5 of Subchapter H (Passenger Vessels), § 95.10–5 of Subchapter I (Cargo and Miscellaneous Vessels), and § 108.417 of Subchapter IA (Mobile Offshore Drilling Units) of this Chapter.

(Sec. 2, 87 Stat. 418 (46 U.S.C. 86); sec. 3, 82 Stat. 341, as amended (46 U.S.C. 367); R.S. 4405, as amended (46 U.S.C. 375); sec. 10, 35 Stat. 428 (46 U.S.C. 395); R.S. 4423, as amended (46 U.S.C. 400); R.S. 4429, as amended (46 U.S.C. 407); R.S. 4430, as amended (46 U.S.C. 408); 88 Stat. 423 (46 U.S.C. 411); R.S. 4434, as amended (46 U.S.C. 412); R.S. 4462, as amended (46 U.S.C. 416); sec. 1, 73 Stat. 475 (46 U.S.C. 481); sec. 4, 67 Stat. 462 (43 U.S.C. 1333(d)); sec. 6(b)(1), 80 Stat. 937 (49 U.S.C. 1655(b)(1)); 49 CFR 1.46(b) and (n)(6))

[CGFR 68-82, 33 FR 18843, Dec. 18, 1968, as amended by CGFR 69-127, 35 FR 9978, June 17, 1970; CGD 73-251, 43 FR 56799, Dec. 4, 1978]

§ 56.50–15 Steam and exhaust piping.

(a) The design pressures of the steam piping connected to the boiler drum or to the superheater inlet header shall not be less than the lowest pressure setting of any drum safety valve. The value of allowable stress for the material shall not exceed that corresponding to the saturated steam temperature at drum pressure and shall be selected as described in § 56.07–10(e).

(b) Main superheater outlet piping systems, desuperheated piping systems, and other auxiliary superheated piping systems led directly from the boiler superheater shall be designed for a pressure not less than the pressure at which the superheater safety valve is set. In the case of a superheated safety valve which is drum pilot actuated, the design pressure of such piping systems shall not be less than the pressure setting of the actuator valve on the drum. Where it can be shown that the limitations set forth in 102.2.4 of ANSI-B31.1 will not be exceeded, the design pressure of such piping systems may be reduced but shall not be less than the pressure setting of the actuator valve on the drum less the pressure drop through the superheater, including associated piping and a control desuperheater if fitted, at the normal rated operating condition. In both cases, the value of allowable stress shall be selected using a temperature not less than that of the steam at the superheater outlet at the normal rated operating conditions in accordance with § 56.07-10(e). Valves and fittings shall be selected for the above temperature and pressure from the accepted standards in Table 56.60-1(b), using the pressure-temperature rating in the standard.

(c) Steam stop valves in sizes exceeding 6 inches shall be fitted with bypasses for heating the line and equalizing the pressure before the valve is opened.

(d) In multiple boiler installations each boiler's main, auxiliary and desuperheated steam lines shall be fitted with two valves, one a stop valve and one a stop check valve.

(e) Main and auxiliary steam stop valves must be readily accessible, operable by one person and arranged to seat against boiler pressure.

(f) Where vessels are equipped with more than one boiler, the auxiliary steam piping shall be so arranged that steam for the whistle, steering gear, and electric-lighting plant may be supplied from any power boiler.

(g) Steam and exhaust pipes shall not be led through coal bunkers or dry cargo spaces unless approved by the Commandant.

(h) Steam piping with the exception of the steam heating system must not be led through passageways, accommodation spaces, or public spaces unless the arrangement is approved by the Commandant. Steam pressure for space heating must not exceed 45 pounds per square inch. High temperature hot water may be used for heating systems above this pressure, but not to exceed 375° F. Such systems should be designed as a complete unit and submitted for approval to the Commandant.

(i) Where positive shutoff valves are fitted in the exhaust lines of machinery, and the exhaust side, including engine steam cylinders and chests, turbine casings, exhaust piping and shutoff valves, is not designed for the full inlet pressure, the exhaust side must be protected from over pressure by one of the following means:

(1) A full flow relief valve in the exhaust side so set and of sufficient capacity to prevent the exhaust side from being accidentally or otherwise subjected to a pressure in excess of its maximum allowable pressure.

(2) A sentinel relief valve or other warning device fitted on the exhaust side together with a back pressure trip device which will close the inlet valve prior to the exhaust side pressure exceeding the maximum allowable pressure. A device that will throttle the inlet valve, so that the exhaust side does not exceed the maximum allowable pressure, may be substituted for the back pressure trip.

(j) Shore steam connections shall be fitted with a relief valve set at a pressure not exceeding the design pressure of the piping.

(Sec. 2, 87 Stat. 418 (46 U.S.C. 86); sec. 3, 82 Stat. 341, as amended (46 U.S.C. 367); R.S. 4405, as amended (46 U.S.C. 375); sec. 10, 35 Stat. 428 (46 U.S.C. 395); R.S. 4423, as amended (46 U.S.C. 400); R.S. 4429, as amended (46 U.S.C. 407); R.S. 4430, as amended (46 U.S.C. 408); 88 Stat. 423 (46 U.S.C. 411); R.S. 4434, as amended (46 U.S.C. 412); R.S. 4462, as amended (46 U.S.C. 416); sec. 1, 73 Stat. 475 (46 U.S.C. 481); sec. 4, 67 Stat. 462 (43 U.S.C. 1333(d)); sec. 6(b)(1), 80 Stat. 937 (49 U.S.C. 1655(b)(1)); 49 CFR 1.46(b) and (n)(6))

[CGFR 68-82, 33 FR 18843, Dec. 18, 1968, as amended by CGFR 69-127, 35 FR 9978, June 17, 1970; CGFR 72-59R, 37 FR 6189, Mar. 25, 1972; CGD 73-254, 40 FR 40165, Sept. 2, 1975; CGD 73-251, 43 FR 56799, Dec. 4, 1978]

§ 56.50-20 Pressure relief piping.

(a) *General.* There shall be no intervening stop valves between the vessel or piping system being protected and its protective device or devices.

(b) *Discharge lines* (*reproduces 122.6.2(d)*). Discharge lines from pressure-relieving safety devices shall be designed to facilitate drainage.

(c) *Stop valves.* There shall be no intervening stop valve between the safety or relief valve and the point of discharge, except as specifically authorized by the Commandant in nuclear systems.

(d) *Reference.* See also § 56.07–10(a) and (b) for specific requirements.

[CGFR 68–82, 33 FR 18843, Dec. 18, 1968, as amended by CGFR 69–127, 35 FR 9979, June 17, 1970]

§ 56.50–25 Safety and relief valve escape piping.

(a) Escape piping from unfired steam generator, boiler, and superheater safety valves shall have an area of not less than that of the combined areas of the outlets of all valves discharging thereto and shall be led as near vertically as practicable to the atmosphere. Other arrangements may be permitted for nuclear systems when specifically authorized by the Commandant.

(b) Expansion joints or flexible pipe connections shall be fitted in escape piping. The piping shall be adequately supported and installed so that no stress is transmitted to the safety valve body.

(c) Safety or relief valve discharges, when permitted to terminate in the machinery space, shall be led below the floorplates or to a remote position to minimize the hazardous effect of the escaping steam.

(d) The effect of the escape piping on the operation of the relief device shall be considered. The back pressure in the escape piping from the main propulsion steam generator should not exceed 10 percent of the relief device setting unless a compensated relief device is used.

§ 56.50–30 Boiler feed piping.

(a) *General requirements.* (1) Steam vessels, and motor vessels fitted with steam driven electrical generators shall have at least two separate means of supplying feed water for the boilers. All feed pumps shall be fitted with the necessary connections for this purpose. The arrangement of feed pumps shall be in accordance with paragraph (d) or (e) of this section.

(2) Feed pump supply to power boilers may utilize the group feed system or the unit feed system.

(3) Feed discharge piping from the pump up to, but not including the required stop and stop-check valves, shall be designed for either the feed pump relief valve setting or the shut-off head of the pump if a relief valve is not fitted. (Refer to § 56.07–10(b) for specific requirements.) Feed piping from the boiler, to and including the required stop and stop-check valves (see paragraph (b) of this section), shall have a design pressure which exceeds the maximum allowable working pressure of the boiler by either 25 percent or 225 pounds per square inch whichever is less. The value of allowable stress for design purposes shall be selected as described in § 56.07–10(e) at a temperature not below that for saturated steam at the maximum allowable working pressure of the boiler.

(4) Feed pumps for water tube boilers shall have fresh water connections only. Care shall be taken to prevent the accidental contamination of feed water from salt water or oil systems.

(b) *Feed valves.* (1) Stop and stop-check valves shall be fitted in the main feed line and shall be attached as close as possible to drum feed inlet nozzles or to the economized feed inlet nozzles on boilers fitted with integral economizers.

(2) Where the installation will not permit the feed stop valve to be attached directly to the drum inlet nozzle on boilers not fitted with economizers, a distance piece may be installed between the stop valve and the inlet nozzle.

(3) Feed stop or stop-check valves may be located near the operating platform on boilers fitted with economizers provided the piping between the valves and the economizer, exclusive of the feed valves and the economizer inlet nozzles, is installed with a minimum of intervening flanged connections.

(4) Auxiliary feed lines shall be fitted with stop valves and stop-check valves. Boilers not having auxiliary feed water nozzles, or where independent auxiliary feed lines are not in-

stalled, shall have the auxiliary feed line to the drum or economizer connected to the main feed line as close as possible to the main feed stop valves; and the valves in the auxiliary feed line shall be fitted as close as possible to the junction point.

(5) Boilers fitted with economizers shall have a check valve fitted in the economizer discharge and located as close as possible to the drum fed inlet nozzle. When economizer bypasses are fitted, a stop-check valve shall be installed in lieu of the aforementioned check valve.

(6) A sentinel valve shall be fitted to an economizer when a valved bypass is installed.

(c) *Feed water regulators, heaters, and grease extractors.* (1) Where feed water regulators, tubular feed water heaters, and grease extractors are installed, an alternate means of operation with these devices bypassed shall be provided.

(2) Feed water regulators designed with a built-in bypass for emergency use need not be fitted with an external bypass when installed in a feed system provided with an auxiliary feed line. All feed water regulators installed in a unit feed system shall be fitted with an external bypass. Feed water regulators bypasses shall be so arranged that the regular feed valves are in operation while the bypass is in use.

(3) A feed water regulator may be interposed between the stop and stop-check valves in the feed lines.

(d) *Group feed system.* Group feed systems shall be provided with pumps and piping as follows:

(1) Oceangoing and Great Lakes steam vessels, having a feed pump attached to the main propelling unit, shall be provided with at least one independently driven feed pump. Each of these pumps shall be used exclusively for feed purposes and shall be capable of supplying the operating boilers at their normal capacity. In addition, a second independently driven pump, capable of supplying such boilers at 75 percent of their normal capacity, shall be provided for emergency use. This second pump may be used for other purposes.

(2) If two independently driven pumps are provided, each capable of supplying the boilers at their normal required operating capacity, and neither of which is used for other purposes, the third or emergency feed pump is not required. Where more than two independently driven feed pumps are provided, their aggregate capacity shall not be less than 200 percent of that demanded by the boilers at their required normal operating capacity.

(3) River or harbor steam vessels shall have at least two means for feeding the boilers; one of which shall be an independently driven pump, the other may be an attached pump, an additional independently driven pump, or an injector.

(e) *Unit feed system.* Unit feed systems shall be provided with pumps and piping as follows:

(1) The unit feed system may be used on vessels having two or more boilers. When the unit feed system is employed each boiler shall have its own independently driven main feed pump capable of supplying the boiler at its normal operating capacity. In addition these shall be an auxiliary independently driven feed pump of the same capacity which can be operated in place of and in conjunction with the main feed pump. In vessels with three or more boilers, not more than two boilers may be served by any one auxiliary pump. The auxiliary pump may be so interconnected that any pump can feed any boiler.

(2) In the unit feed system, a separate feed line shall be provided for each boiler from its pumps. A separate auxiliary feed line is not required. The discharge from each pump and the feed supply to each boiler shall be automatically controlled by the level of the water in that boiler. In addition to the automatic control, manual control shall be provided.

(f) *Feedwater.* The feedwater shall be introduced into a boiler as required by § 52.01–105(b) of this subchapter.

§ 56.50–35 Condensate pumps.

Two means shall be provided for discharging the condensate from the main condenser, one of which shall be mechanically independent of the main propelling machinery. If one of the independent feed pumps is fitted with a direct suction from the condenser and a discharge to the feed tank, it may be accepted as an independent condensate pump. On vessels operating on lakes (including Great Lakes), bays, sounds, or rivers, where provision is made to operate noncondensing, only one condensate unit will be required.

§ 56.50-40 Blowoff piping (replaces 102.2.5(d)).

(a)(1) The requirements for blowoff piping in this section shall be followed in lieu of the requirements in 102.2.5(d) in ANSI-B31.1.

(2) Where blowoff valves are connected to a common discharge from two or more boilers, a nonreturn valve shall be provided in the line from each boiler to prevent accidental blowback in the event the boiler blowoff valve is left open.

(b) Blowoff piping external to the boiler shall be designed for not less than 125 percent of the maximum allowable working pressure of the boiler, or the maximum allowable working pressure of the boiler plus 225 pounds per square inch, whichever is less. When the required blowoff piping design pressure exceeds 100 pounds per square inch gage, the wall thickness of the piping shall not be less than Schedule 80. The value of allowable stress for design purposes shall be selected as described in § 56.07-10(e) at a temperature not below that of saturated steam at the maximum allowable working pressure of the boiler.

(c) Boiler blowoff piping which discharges above the lightest loadline of a vessel shall be arranged so that the discharge is deflected downward.

(d) Valves such as the globe type so designed as to form pockets in which sediment may collect shall not be used for blowoff service.

[CGFR 68-82, 33 FR 18843, Dec. 18, 1968, as amended by CGFR 69-127, 35 FR 9978, June 17, 1970; CGD 73-254, 40 FR 40165, Sept. 2, 1975]

§ 56.50-45 Circulating pumps.

(a) A main circulating pump and emergency means for circulating water through the main condenser shall be provided. The emergency means may consist of a connection from an independent power pump fitted between the main circulating pump and the condenser.

(b) Independent sea suctions shall be provided for the main circulating and the emergency circulating pumps.

(c) A cross connection between the circulating pumps in the case of multiple units will be acceptable in lieu of an independent power pump connection.

(d) On vessels operating on lakes (including Great Lakes), bays, sounds, or rivers, where provision is made to operate noncondensing, only one circulating unit will be required.

§ 56.50-50 Bilge and ballast piping.

(a)(1) All vessels except unmanned barges shall be provided with a satisfactory bilge pumping plant capable of pumping from and draining any watertight compartment except for ballast, oil and water tanks which have acceptable means for filling and emptying independent of the bilge system. The bilge pumping system shall be capable of operation under all practicable conditions after a casualty whether the ship is upright or listed. For this purpose wing suctions will generally be necessary except in narrow compartments at the ends of the vessel where one suction may be sufficient. In compartments of unusual form, additional suctions may be required.

(2) Arrangements shall be made whereby water in the compartments will drain to the suction pipes. Efficient means shall be provided for draining water from all tank tops, other watertight flats and insulated holds. Peak tanks, chain lockers and decks over peak tanks may be drained by eductors, ejectors, or hand pumps. Where piping is led through the forepeak, see § 56.50-1(b).

(3) Where drainage from particular compartments is considered undesirable, the provisions for such drainage may be omitted, provided it can be shown by calculations that the safety of the vessel will not be impaired.

(b) Passenger vessels shall have provision made to prevent the compartment served by any bilge suction piping from being flooded in the event the pipe is severed or otherwise damaged by collision or grounding in any other compartment. Where the piping is located within one-fifth of the beam of the side of the vessel (measured at right angles to the centerline at the level of the deepest subdivision loadline or deepest loadline where a subdivision loadline is not assigned) or is in a ductkeel, a nonreturn valve shall be fitted to the end of the pipe in the compartment which it serves.

(c)(1) Bilge suctions shall be led from manifolds. Such manifolds shall, insofar as practicable, be located in, or be capable of remote operation from, the same space as the bilge pump which normally takes suction on that manifold. In either case the manifolds shall be capable of being locally controlled from above the floorplates, and shall be easily accessible at all times. Except as otherwise permitted by paragraph (h) of this section for Great Lakes cargo vessels employing a common bilge and ballast system for the cargo spaces, bilge manifold valves controlling bilge suctions from various compartments shall be of the stop-check type.

(2) Passenger vessels engaged on international voyages shall have the manifolds and valves in the bilge pumping system so arranged that in the event of flooding, one of the bilge pumps can take suction from any compartment; and in addition, damage to a pump or its pipe connecting to the bilge main outboard of a line drawn at one-fifth of the beam of the vessel shall not render the bilge system inoperative.

(3) If a bilge system common to all pumps is installed on passenger vessels engaged on international voyages, the necessary valves for controlling the bilge suctions shall be operable from above the bulkhead deck. If, in addition to the main bilge pumping system, an emergency bilge pumping system is installed, it shall be independent of the main system and so arranged that a pump is capable of operating on any compartment under flooding conditions. In such cases, only the valves necessary for the operation of the emergency bilge system need be capable of being operated from above the bulkhead deck.

(d) The internal diameter of bilge suction pipes including strainers shall be determined by formulas (1) and (2), except that the nearest commercial size not more than one-fourth inch under the required diameter may be used. Bilge suction pipes shall be suitably faired to pump inlets.

(1) For suctions to each main bilge pump:

$$d=1+\sqrt{\frac{(L(B+D)}{2500}} \qquad (1) \quad (4) \quad (5)$$

(2) For branch suctions to cargo and machinery spaces:

$$d=1+\sqrt{\frac{c(B+D)}{1500}} \qquad (2) \quad (3) \quad (5)$$

where:

L=Length of vessel on loadwater line, in feet.

B=Breadth of vessel, in feet. (5)

D=Molded depth of bulkhead deck, in feet.

c=Length of compartment, in feet.

d=Required internal diameter of suction pipe, in inches.

NOTE 1.—For tankers "L" may be reduced by the combined length of the cargo oil tanks.

NOTE 2.—For bulk carriers with full depth wing tanks served by a ballast system where the beam of the vessel is not representative of the breadth of the compartment, "B" may be appropriately modified to the breadth of the compartment.

NOTE 3.—In the calculation for a vessel with more than one hull, such as a catamaran, the breadth of the unit is the breadth of one hull.

NOTE 4.—In the calculation for a mobile offshore drilling unit, "L" is reducible by the combined length of spaces that can be pumped by another piping system meeting §§ 56.50-50 and 56.50-55, where "L" is the length of the unit at the waterline.

NOTE 5.—For mobile offshore drilling units employing unusual hull forms, "B" may be modified to the average breadth rather than the maximum breadth.

(3) For vessels of 150 gross tons and over, no main suction piping shall be less than 2½ inches internal diameter. Branch piping need not be more than 4 inches and shall not be less than 2 inches in diameter except for drainage

of small pockets or spaces in which case 1½-inch diameter may be used. For vessels less than 150 gross tons no bilge suction shall be less than 1½ inches internal diameter and no branch piping shall be less than 1 inch nominal pipe size.

(4) For vessels of 65 feet in length or less and not engaged on an international voyage, the bilge pipe sizes computed by Formulas (1) and (2) of this paragraph are not mandatory, but in no case shall the size be less than 1 inch nominal pipe size.

(5) The number, location, and size of bilge suctions in the boiler and machinery compartments shall be determined when the piping plans are submitted for approval and shall be based upon the size of the compartments and the drainage arrangements.

(e) *Independent bilge suction.* One of the independent bilge pumps must have a suction of a diameter not less than that given by Formula (2) in paragraph (d) of this section that is led directly from the engine room bilge entirely independent of the bilge main, and on passenger vessels each independent bilge pump located in the machinery spaces must have such direct suctions from these spaces, except that not more than two pumps are required to have direct suctions from any one space. A suction that is led directly from a suitably located pump manifold may be considered to be independent of the bilge main. Where two direct suctions are required in any one compartment on passenger vessels, one suction must be located on each side of the compartment. If watertight bulkheads separate the engine and boiler rooms, a direct suction or suctions must be fitted to each compartment unless the pumps available for bilge service are distributed throughout these compartments, in which case at least one pump in each such compartment must be fitted with direct suction in its compartment. In a vessel with more than one hull, there must be one bilge pump that has an independent bilge suction in each hull. In a column stabilized mobile offshore drilling unit, the independent bilge suction must be from the pumproom bilge.

(f) *Emergency bilge suctions.* In addition to the independent bilge suction(s) required by paragraph (e) of this section, an emergency bilge suction shall be provided in the machinery space for all self-propelled vessels except as described in the following subparagraphs. Emergency suctions shall be provided from pumps other than those required by § 56.50-55(a). Such suctions shall have nonreturn valves, and shall meet the following criteria as appropriate:

(1) On passenger vessels propelled by steam and operating on an international voyage or on ocean, coastwise, or Great Lakes routes, the main circulating pump is to be fitted with a direct bilge suction for the machinery space. The diameter of such suctions shall not be less than two-thirds the diameter of the main sea injection. When it can be shown to the satisfaction of the Commandant that the main circulating pump is not suitable for emergency bilge service, a direct emergency bilge suction is to be led from the largest available independent power driven pump to the drainage level of the machinery space. The suction is to be of the same diameter as the main inlet of the pump used and the capacity of the pump shall exceed that of a required main bilge pump.

(2) On passenger vessels propelled by internal combustion engines and operating on an international voyage or on ocean, coastwise, or Great Lakes routes, the largest available pump in the engine room is to be fitted with the direct bilge suction in the machinery space except that a required bilge pump may not be used. The area of the suction pipe is to be equal to the full suction inlet of the pump. The discharge capacity of the pump selected shall exceed the capacity of the required main bilge pump.

(3) Vessels over 180 feet in length which are not passenger vessels and which operate on international voyages or in ocean, coastwise, or Great Lakes service, shall be provided with a direct emergency bilge suction from any pump in the machinery space, except that a required bilge pump may not be used. The discharge capacity of the pump selected shall exceed the capacity of the required main bilge

pump and the area of the suction inlet is to be equal to the full suction inlet of the pump.

(4) Vessels under 180 feet in length need not provide an emergency bilge suction, expect that passenger vessels shall comply with the requirements of paragraphs (f) (1) and (2) of this section.

(5) Each vessel with more than one hull must have an emergency bilge suction in each hull.

(6) Each column stabilized mobile offshore drilling unit must have—

(i) An emergency bilge suction in each hull; and

(ii) A remote control for the emergency pump and associated valves that can be operated from the ballast control room.

(g) Each individual bilge suction shall be fitted with a suitable bilge strainer having an open area of not less than three times at of the suction pipe. In addition a mud box or basket strainer shall be fitted in an accessible position between the bilge suction manifold and the pump.

(h) Pipes for draining cargo or machinery spaces shall be separate from pipes which are used for filling or emptying spaces where water or oil is carried. Bilge and ballast pumping systems shall be so arranged as to prevent oil or water from the sea or ballast spaces from passing into cargo or machinery spaces, or from passing from one compartment to another, whether from the sea, water ballast or oil tanks. The bilge and ballast mains shall be fitted with separate control valves at the pumps. The requirements of this paragraph do not apply to bilge and ballast systems on Great Lakes cargo vessels which may employ a common line for the bilge and ballast system for the cargo spaces.

(i) Ballast piping shall not be installed to any hull compartment of a wood vessel. Where the carriage of liquid ballast in such vessels is necessary, suitable ballast tanks, structurally independent of the hull, shall be provided.

(j) When dry cargo is to be carried in deep tanks, arrangement shall be made for disconnecting or blanking-off the oil and ballast lines, and the bilge suctions shall be disconnected or blanked-off when oil or ballast is carried. Blind flanges or reversible pipe fittings may be employed for this purpose.

(k) Where bilge or ballast piping is led through deep tanks, means shall be provided to prevent the flooding of the compartments being served in the event of pipe leakage within the tanks. Such means may consist of an oiltight or watertight pipe tunnel, or the lines may be of Schedule 80 pipe thickness, fitted with expansion bends, and all joints within the tanks shall be welded. Where a pipe tunnel is installed, the watertight integrity of the bulkheads shall be maintained and if the tunnel is not of sufficient size to afford easy access, no valve or fitting shall be located therein. Bilge lines led through deep tanks without a pipe tunnel shall be fitted with nonreturn valves at the bilge suctions.

(l) When bilge pumps are utilized for other services, the piping shall be so arranged that under any condition at least one pump will be available for drainage of the vessel through an overboard discharge, while the other pump(s) are being used for a different service.

(m) All bilge pipes used in or under fuel storage tanks or in the boiler or machinery space, including spaces in which oil settling tanks or oil pumping units are located, shall be of steel or other acceptable material.

(n) Oil pollution prevention requirements for bilge and ballast systems are contained in Subpart B of Part 155, Title 33, Code of Federal Regulations.

NOTE: For the purposes of this section, a pumproom is a machinery space on a column stabilized mobile offshore drilling unit.

(Sec. 2, 87 Stat. 418 (46 U.S.C. 86); sec. 3, 82 Stat. 341, as amended (46 U.S.C. 367); R.S. 4405, as amended (46 U.S.C. 375); sec. 10, 35 Stat. 428 (46 U.S.C. 395): R.S. 4423, as amended (46 U.S.C. 400); R.S. 4429, as amended (46 U.S.C. 407); R.S. 4430, as amended (46 U.S.C. 408); 88 Stat. 423 (46 U.S.C. 411); R.S. 4434, as amended (46 U.S.C. 412); R.S. 4462, as amended (46 U.S.C. 416); sec. 1, 73 Stat. 475 (46 U.S.C. 481); sec. 4, 67 Stat. 462 (43 U.S.C. 1333(d)); sec. 6(b)(1), 80 Stat. 937 (49 U.S.C. 1655(b)(1)); 49 CFR 1.46 (b) and (n)(6))

[CGFR 68-82, 33 FR 18843, Dec. 18, 1968, as amended by CGFR 69-127, 35 FR 9979, June 17, 1970; CGD 73-58R, 39 FR 18767, May 30, 1974; CGD 73-251, 43 FR 56800, Dec. 4, 1978; 79-165a, 45 FR 64188, Sept. 29, 1980]

§ 56.50-55 Bilge pumps.

(a) *Self-propelled vessels.* (1) All self-propelled vessels shall be provided with power pumps connected to the bilge main as required in Table 56.50-55(a).

TABLE 56.50-55(a)—POWER BILGE PUMPS REQUIRED FOR SELF-PROPELLED VESSELS

Vessel length, in feet	Passenger vessels [1]			Dry cargo vessel [2]		Tank vessels	Mobile offshore drilling units
	International voyage [3]	Ocean coastwise, and Great Lakes	All other waters	Ocean, coastwise, and Great Lakes	All other waters	All waters	All waters
180′ or more	[4] 3	[4] 3	2	3	2	2	2
Below 180′ and exceeding 65′	[4] 3	[5] 2	[5] 2	[5] 2	[5] 2	2	2
65′ or less	3	1	1	1	1	1	2

[1] Small passenger vessels under 100 gross tons refer to Subpart 182.25 of Subchapter T (Small Passenger Vessel) of this chapter.

[2] Dry bulk carriers having ballast pumps connected to the tanks outside the engineroom and to the cargo hold may substitute the appropriate requirements for tank vessels.

[3] Not applicable to passenger vessels which do not proceed more than 20 miles from the nearest land, or which are employed in the carriage of large numbers of unberthed passengers in special trades.

[4] When the criterion numeral exceeds 30, an additional independent power driven bilge pump is required. (See Part 73 Subchapter H (Passenger Vessels) of this chapter, for determination of criterion numeral.)

[5] Vessels operating on lakes (including Great Lakes), bays, sounds, or rivers where steam is always available, or where suitable water supply is available from a power pump of adequate pressure and capacity, siphons or eductors may be substituted for one of the required power pumps, provided a siphon or eductor is permanently installed in each hold or compartment.

(2) On passenger vessels 300 feet or more in length engaged in international voyages, and on all other passenger vessels engaged in international voyages having a criterion numeral of 30 or more, one of the power bilge pumps shall be available at all times for use under emergency conditions in which a vessel may be flooded at sea. One of the following installations will be considered as complying with the requirements of this paragraph:

(i) One of the required bilge pumps is an emergency pump of a reliable submersible type, the source of power for which shall be located above the bulkhead deck; or,

(ii) The bilge pumps and their sources of power are located throughout the ship so that under any condition of flooding which the vessel is required to withstand, at least one pump will be available in an undamaged compartment.

(3) One of the required power bilge pumps may be attached to the propelling engine. For vessels with more than one hull, one of the required bilge pumps in each hull may be attached to a propelling engine.

(4) The bilges forward of the cargo on tankships may be drained by a power or hand pumps, siphons, or eductors. If siphons or eductors are employed, they shall be permanently installed in each compartment.

(5) On Great Lakes cargo vessels which do not employ a common bilge and ballast main, the pumps used for bilge suction are not required to be connected to a bilge main.

(6) Each hull of a vessel with more than one hull, such as a catamaran, must meet Table 56.50-55(a).

(b) *Nonself-propelled vessels.* (1) Ocean going sailing vessels and barges shall be provided with pumps connected to the bilge main as required in Table 56.50-55(b)(1).

TABLE 56.50-55(b)(1)—BILGE PUMPS REQUIRED FOR NONSELF-PROPELLED VESSELS

Type of vessel	Waters navigated	Power pumps [1]	Hand pumps
Sailing	Ocean and coastwise.	Two	(2)
Manned barges	do	Two	(2)
Unmanned barges	All waters	(3)	(3)
Mobile offshore drilling units.	All waters	Two	None

[1] Where power is always available, independent power bilge pumps shall be installed as required and shall be connected to the bilge main.

[2] Efficient hand pumps connected to the bilge main may be substituted for the power pumps. Where there is no common bilge main, one hand pump will be required for each compartment.

[3] Suitable hand or power pumps or siphons, portable or fixed, carried either on board the barge or on the towing vessel shall be provided.

(2) The pumps and source of power for operation on oceangoing sailing vessels and barges shall be located above the bulkhead deck or at the highest convenient level which is always accessible.

(3) Each hull of a vessel with more than one hull, such as a catamaran, must meet Table 56.50-55(b).

(c) *Capacity of independent power bilge pump.* Each power bilge pump shall have a capacity of developing a suction velocity of not less than 400 feet per minute through the bilge suction pipe required by § 56.50-50 under ordinary conditions, except that for vessels of less than 65 feet in length not engaged on international voyages the pump shall have a minimum capacity of 25 gallons per minute and need not meet the velocity requirements of this paragraph.

(d) *Priming.* Suitable means shall be provided for priming centrifugal pumps which are not of the self-priming type.

(e) *Location.* (1) For self-propelled vessels, if the engines and boilers are in two or more watertight compartments, the bilge pumps shall be distributed throughout these compartments. When the location of bilge pumps in separate watertight compartments is not possible, the Commandant will consider alternate arrangements of the bilge pumps.

(2) For nonself-propelled vessels requiring two bilge pumps, these pumps, insofar as practicable, shall be located in separate watertight machinery spaces. When the location of bilge pumps in separate watertight compartments is not possible, the Commandant will consider alternate arrangements of the bilge pumps.

(3) The emergency bilge pumps shall not be installed in a passenger ship forward of the collision bulkhead.

(4) Each hull of a vessel with more than one hull must have at least two means for pumping the bilges in each hull. No multi-hulled vessel may operate unless one of these means is available to pump each bilge.

(f) *Other pumps.* Sanitary, ballast, and general service pumps having the required capacity may be accepted as independent power bilge pumps if fitted with the necessary connections to the bilge pumping system.

(Sec. 2, 87 Stat. 418 (46 U.S.C. 86); sec. 3, 82 Stat. 341, as amended (46 U.S.C. 367); R.S. 4405, as amended (46 U.S.C. 375); sec. 10, 35 Stat. 428 (46 U.S.C. 395): R.S. 4423, as amended (46 U.S.C. 400); R.S. 4429, as amended (46 U.S.C. 407); R.S. 4430, as amended (46 U.S.C. 408); 88 Stat. 423 (46 U.S.C. 411); R.S. 4434, as amended (46 U.S.C. 412); R.S. 4462, as amended (46 U.S.C. 416); sec. 1, 73 Stat. 475 (46 U.S.C. 481); sec. 4, 67 Stat. 462 (43 U.S.C. 1333(d)); sec. 6(b)(1), 80 Stat. 937 (49 U.S.C. 1655(b)(1)); 49 CFR 1.46 (b) and (n)(6))

[CGFR 68-82, 33 FR 18843, Dec. 18, 1968, as amended by CGD 73-251, 43 FR 56800, Dec. 4, 1978]

§ 56.50-60 Cargo oil systems and fuel oil systems for boilers and internal combustion engines; transfer systems, and general arrangement.

(a) Oil-piping systems for the transfer or discharge of cargo or fuel oil shall be separate from other piping systems as far as practicable, and positive means shall be provided to prevent dangerous interconnection in service.

(b) When it is necessary to heat the oil to facilitate its transfer, heating coils shall be properly installed in the tanks. The drains from the heating coils as well as the steam drains from oil heaters in the service system shall be run to an open inspection tank or other suitable oil detector before being returned to the feed system.

(c) Filling pipes may be led directly from the deck into the tanks or to a manifold in an accessible location permanently marked to indicate tanks to which they are connected and from which the oil can be distributed to the various tanks through the piping system. The end of filling pipes shall be fitted with a shutoff valve which shall be kept closed when not in use. Alternate arrangements where gravity systems for filling are employed will be given special consideration by the Commandant.

(d) Piping subject to internal head pressure from oil in the tank shall be fitted with positive shutoff valves located at the tank.

(1) Valves installed on the outside of the oil tanks shall be made of steel, ductile cast iron ASTM A-395 or A-445, or a ductile nonferrous alloy having a melting point above 1,700° F. and shall be arranged for local manual control at the valve and from a readily accessible and safe location outside of the compartment in which the valves are located.

(2) If valves are installed on the inside of the tank, they may be made of cast iron and arranged for remote control only. Additional valves for local control shall be located in the space where the system exits from the tank or adjacent tanks. Valves for local control outside the tanks shall be made of steel, ductile cast iron ASTM A-395 or A-445, or a ductile nonferrous alloy having a melting point above 1,700° F.

(3) Power operated valves installed to comply with the requirements of this paragraph shall meet the following requirements:

(i) The valve actuators shall be capable of closing the valve under all conditions except physical interruption of the power system (i.e., cable breakage, tubing rupture, etc.). This will require that all power actuated valves other than those opened against spring pressure shall be provided with an energy storage system which is protected from fire and collision as far as practicable. The storage system shall be used for no other purpose and shall have sufficient capacity to cycle all connected valves once (i.e., from the initial valve position to the opposite and return). The cross connection of this system to an alternate power supply will be given special consideration by the Commandant.

(ii) The valve shall have a local power actuator to both open and close the valve unless local manual opening operation will not prevent remote closing of the valve.

(iii) The positioning of the valve by either the local or remote actuators shall not void the ability of the other actuator to close the valve.

(iv) The valve shall be provided with a means of emergency manual operation to both open and close the valve regardless of the status of the power operating system. Such manual operation may interfere with the power operation, and if so, shall be protected from causal use by means of covers, locking devices, or other suitable means. Instructions and warnings regarding the emergency system shall be conspicuously posted at the valve.

(4) Remote operation for shutoff valves on small independent fuel oil tanks will be specially considered in each case where the size of tanks and their location may warrant the omission or remote operating rods.

(e) Fuel oil tanks overhanging boilers are prohibited.

(f) Valves for drawing fuel or draining water from fuel are not permitted in fuel oil systems except that a single valve may be permitted in the case of diesel driven machinery if suitably located within the machinery space away from any potential source of ignition. Such a valve shall be fitted with a cap or a plug to prevent leakage.

(g) Test cocks must not be fitted to fuel oil or cargo oil tanks.

[CGFR 68-82, 33 FR 18843, Dec. 18, 1968, as amended by CGFR 69-127, 35 FR 9979, June 17, 1970; CGD 73-254, 40 FR 40165, Sept. 2, 1975]

§ 56.50-65 Boiler fuel oil service systems.

(a) All discharge piping from the fuel oil service pumps to boiler burners shall be seamless steel with a thickness of at least Schedule 80. If required by § 56.07-10(e) or 104.1.2 of ANSI-B31.1, the thickness shall be greater than Schedule 80. Short lengths of steel, or annealed copper nickel, nickel copper, or copper pipe and tubing may be used between the fuel oil boiler front header manifold and the atomizer head to provide flexibility. All material used shall meet the requirements of Subpart 56.60. The use of nonmetallic materials is prohibited. The thickness of the short lengths shall not be less than the larger of 0.035 inch or that required by § 56.07-10(e). Flexible metallic tubing may be considered for such application when approved by the Commandant. Tubing fittings shall be of flared type except that flareless fittings of the nonbite type may be used when the tubing is steel, nickel copper or copper nickel.

(b)(1) All vessels having oil fired propulsion boiler(s) shall have at least two fuel service pumps, each of sufficient capacity to supply all the boilers at full power, and arranged so that one may be overhauled while the other is in service. At least two fuel oil heaters of approximately equal capacity shall be installed and so arranged that any heater may be overhauled while the other(s) is (are) in service. Suction and discharge strainers shall be of the duplex or other type capable of being cleaned without interrupting the oil supply and discharge strainers shall be located so as to preclude the possibility of spraying oil on the boiler casing or shall be provided with spray shields. Coamings, drip pans, etc., shall be fitted under fuel oil service pumps, heaters, etc., where necessary to prevent oil drainage to the bilge.

(2) All auxiliary boilers, except those furnishing steam for vital equipment and fire extinguishing purposes other than duplicate installations, may be equipped with a single fuel oil service pump and a single fuel oil heater. Such pumps need not be fitted with discharge strainers.

(3) Boilers burning fuel oils of low viscosity need not be equipped with fuel oil heaters, provided acceptable evidence is furnished to indicate that satisfactory combustion will be obtained without the use of heaters.

(c) Piping between service pumps and burners shall be located so as to be readily observable, and all bolted flange joints shall be provided with a wrap around deflector to deflect spray in case of a leak. The relief valve located at the pump and the relief valves fitted to the fuel oil heaters shall discharge back into the settling tank or the suction side of the pump. The return line from the burners shall be so arranged that the suction piping cannot be subjected to discharge pressure.

(d) If screwed-bonnet valves are employed, they shall be of the union-bonnet type capable of being packed under pressure.

(e) Unions shall not be used for pipe diameters of 1 inch and above.

(f) Boiler header valves of the quick closing type shall be installed in the fuel supply lines as close to the boiler front header as practicable. The location is to be accessible to the operator or remotely controlled.

(g) Bushings and street ells are not permitted in fuel oil discharge piping.

(h) Fuel oil service pumps shall be equipped with controls to comply with § 58.01-25(a) of this subchapter.

[CGFR 68-82, 33 FR 18843, Dec. 18, 1968, as amended by CGFR 69-127, 35 FR 9978, June 17, 1970]

§ 56.50-70 Gasoline fuel systems.

(a) *Material.* (1) Fuel supply piping to the engines shall be of seamless drawn annealed copper pipe or tubing, nickel copper, or copper nickel pipe or tubing meeting the requirements of Subpart 56.60.

(2) Tubing wall thicknesses shall not be less than the larger of that shown in Table 56.50-70(a), or as required by § 56.07-10(e) and 104.1.2 of ANSI-B31.1.

(3) Tubing fittings shall be of nonferrous drawn or forged metal and of the flared type except that the flareless fittings of the nonbite type may be used when the tubing system is of nickel copper or copper nickel. Tubing shall be cut square and flared by suitable tools Tube ends shall be annealed before flaring. Pipe fittings shall be of nonferrous material. Pipe thread joints shall be made tight with a suitable compound.

(4) Valves for fuel lines shall be of nonferrous material of the union bonnet type with ground seats except that cocks may be used if they are the

solid bottom type with tapered plugs and union bonnets.

TABLE 56.50-70(a)—TUBING WALL THICKNESS

Outside diameter of tubing in inches	Thickness	
	B.W.G.	Inch
⅛, 3/16, ¼	#21	0.032
5/16, ⅜	#20	.035
7/16, ½	#19	.042

(b) *Installation.* (1) All fuel pipes, pipe connections, and accessories shall be readily accessible. The piping shall run in sight wherever practicable, protected against mechanical injury, and effectively secured against excessive movement and vibration by the use of soft nonferrous metal liners or straps without sharp edges. Where passing through steel decks or bulkheads, fuel lines shall be protected by close fitting ferrules or stuffing boxes. Refer to § 56.30-25 for tubing joint installations.

(2) A short length of suitable metallic or nonmetallic flexible tubing or hose, or a loop of annealed copper tubing shall be installed in the fuel supply line at or near the engine to prevent damage by vibration. If nonmetallic flexible hose is used it shall meet the requirements of § 56.60-25(c) for fuel service. Flexible hose connections should maintain metallic contact between the sections of the fuel supply lines; however, if such contact is not maintained, the fuel tank shall be grounded.

(3) Valves in fuel lines shall be installed to close against the flow.

(c) *Shutoff valves.* Shutoff valves of a suitable type shall be installed in the fuel supply lines, one as close to each tank as practicable, and one as close to each carburetor as practicable. Where fuel tanks are installed below the weather deck, arrangements shall be provided for operating all shutoff valves at the tanks from outside the compartments in which they are located, preferably from an accessible position on the weather deck. The operating gear for the shutoff valves at the tanks shall be accessible at all times and shall be suitably marked.

(d) *Strainers.* A suitable twin strainer shall be fitted in the fuel supply line in the engine compartment. Strainers shall be of the type opening on top for cleaning screens. A drip pan shall be fitted under the strainer.

(e) *Outlets and drains.* Outlets in fuel lines for drawing gasoline for any purpose are prohibited. Valved openings in the bottom of fuel tanks are prohibited; however, openings fitted with threaded plug or cap can be used for cleaning purposes.

(f) *Fuel suction connections.* All fuel suction and return lines shall enter the top of the fuel tanks and connections shall be fitted into spuds. Such lines shall extend nearly to the bottom of the tank.

(g) *Filling and sounding pipes.* Filling and sounding pipes shall be so arranged that vapors or possible overflow when filling cannot escape to the inside of the vessel but will discharge overboard. Such pipes shall terminate on the weather deck clear of any coamings and shall be fitted with suitable shutoff valves or deck plugs. Filling and sounding pipes shall extend to within one-half of their diameter from the bottom of the tank or from the surface of the striking plate in case of a sounding pipe. A flame screen of noncorrodible wire mesh shall be fitted in the throat of the filling pipe. Sounding pipes shall be kept closed at all times except during sounding.

(h) *Vent pipes.* Each tank shall be fitted with a vent, the cross-sectional area of which shall not be less than that of the filling pipe. The vent pipes shall terminate at least 2 feet above the weather deck and not less than 3 feet from any opening into living quarters or other below deck space. The ends of vent pipes shall terminate with U-bends and shall be fitted with flame screens or flame arresters. The flame screens shall consist of a single screen of corrosion resistant wire of at least 30 by 30 mesh.

(i) *Gasoline tanks.* For requirements pertaining to independent gasoline fuel tanks see Subpart 58.50 of this subchapter.

(j) *Fuel pumps.* Fuel pumps shall be equipped with controls to comply with § 58.01-25(a) of this subchapter.

[CGFR 68-82, 33 FR 18843, Dec. 18, 1968, as amended by CGFR 69-127, 35 FR 9978, June 17, 1970; CGFR 72-59R, 37 FR 6189, Mar. 25, 1972]

§ 56.50-75 Diesel fuel systems.

(a) *Vessels greater than 100 gross tons.* (1) The diesel fuel system shall comply with §§ 56.50-60, 56.50-85, and 56.50-90. The fuel supply piping to engines shall be of seamless steel, annealed seamless copper or brass pipe or tubing, or of nickel copper or copper nickel alloy meeting the requirements of Subpart 56.60 for materials and § 56.50-70(a)(2) for thickness. Fuel oil service or unit pumps shall be equipped with controls to comply with § 58.01-25(a) of this subchapter.

(2) The installation shall comply with § 56.50-70(b).

(3) Tubing connections and fittings shall be drawn or forged metal of the flared type except that flareless fittings of the nonbite type may be used when the tubing system is steel, nickel-copper, or copper-nickel. When making flared tube connections the tubing shall be cut square and flared by suitable tools. Tube ends shall be annealed before flaring.

(b) *Vessels of 100 gross tons and less and tank barges.* (1) *Materials.* Fuel supply piping shall be of copper, nickel copper or copper nickel having a minimum wall thickness of 0.035 inch except that piping of other materials such as seamless steel pipe or tubing which provides equivalent safety may be used.

(2) *Tubing connections and fittings.* Tubing connections shall comply with the provisions of § 56.50-75(a)(3).

(3) *Intallation.* The installation of diesel fuel piping shall comply with the requirements of § 56.50-70(b).

(4) *Shutoff valves.* Shutoff valves shall be installed in the fuel supply lines, one as close to each tank as practicable, and one as close to each fuel pump as practicable. Valves shall be accessible at all times.

(5) *Outlets and drains.* Valves for removing water or impurities from fuel oil systems will be permitted in the machinery space provided such valves are fitted with caps or plugs to prevent leakage.

(6) *Filling pipe.* Tank filling pipes on motorboats and motor vessels of less than 100 gross tons and tank barges shall terminate on an open deck and shall be fitted with suitable shutoff valves, deck plugs, or caps.

(7) *Vent pipes.* Each tank shall be fitted with a vent pipe complying with § 56.50-85.

(8) *Independent diesel fuel tanks.* See Subpart 58.50 of this subchapter for specific requirements.

§ 56.50-80 Lubricating oil system.

(a) The lubricating oil system shall be designed to function satisfactorily when the vessel has a permanent 15° list and a permanent 5° trim.

(b) When pressure or gravity-forced lubrication is employed for the steam driven main propelling machinery, an independent auxiliary lubricating pump shall be provided.

(c) Oil coolers on steam driven machinery shall be provided with two separate means of circulating water through the coolers.

(d) For internal combustion engine installations, the requirements of paragraphs (b) and (c) of this section shall be met, but they do not apply to vessels in river and harbor service, nor to any vessel below 300 gross tons. Where the size and design of an engine is such that lubrication before starting is not necessary and an attached pump is normally used, the independent auxiliary pump is not required if a duplicate of the attached pump is carried as spare. In meeting the requirements of paragraph (c) of this section in the case of internal combustion engines, two separate means are to be provided for circulating coolant on those engines on which oil coolers are fitted. One of those means must be independently driven and may consist of a connection from a pump of adequate size normally used for other purposes utilizing the required coolant. Where the design of an engine will not readily accommodate an independent pump connection, the independent auxiliary pump will not be required if a duplicate of the attached pump is carried as a spare. Oil filters shall be provided on all internal combustion engine installations. On main propulsion engines which are fitted with full-flow type filters, the arrangement shall be such that the filters may be cleaned without interrupting the oil supply except that such an arrangement is not required on vessels having more than a single main propulsion engine.

(e) The lubricating oil piping shall be independent of other piping systems and shall be provided with necessary coolers, heaters, filters, etc., for proper operation. Oil heaters shall be fitted with bypasses.

(f) Diesel engine lubrication systems shall be so arranged that vapors from the sump tank may not be discharged back into the engine crank case of engines of the dry sump type.

(g) Steam turbine driven propulsion and auxiliary generating machinery depending on forced lubrication shall be arranged to shut down automatically upon failure of the lubricating system.

(h) Piping subject to internal head pressure from lube oil in a storage tank shall be fitted with a positive shutoff valve of steel, ductile iron, or a ductile nonferrous alloy having a melting point above 1,700° F. located at the tank.

[CGFR 68-82, 33 FR 18843, Dec. 18, 1968, as amended by CGFR 69-127, 35 FR 9979, June 17, 1970]

§ 56.50–85 Tank vent piping.

(a) This section applies to vents for spaces in which liquid is carried as fuel, ship stores, cargo or ballast.

(1) The structural arrangement in double bottom and other tanks shall be such as to permit the free passage of air and gases from all parts of the tanks to vent pipes. Tanks in nuclear systems shall be provided with means for preventing uncontrolled release of hazardous amounts of radioactive materials.

(2) Tanks having a comparatively small surface, such as fuel oil settling tanks, need be fitted with only one vent pipe, but tanks having a comparatively large surface shall be fitted with at least two vent pipes. The vents shall be located so as to provide venting of the tanks under any service condition.

(3) Vent pipes for fuel oil tanks shall, wherever possible, have a slope of no less than 30°. Header lines, where both ends are adequately drained to a tank, are excluded from this requirement.

(4) Vents of fresh water tanks must extend above the weather deck unless they terminate within the machinery space, in which case they shall terminate well above the deep loadline. Vents for tanks having no boundary in common with the hull, and which terminate in the machinery space, need not extend above the deep loadline.

(4-a) Vents from ballast and fuel oil tanks shall extend above the weather deck and the vents from oil tanks shall terminate not less than 3 feet from any opening into living quarters.

(5) Vents from fuel oil and other tanks extending above the freeboard or superstructure deck shall be of substantial construction. Except for barges in inland service and on Great Lakes vessels, the height from the deck to any point where water may gain access below deck shall be at least 30 inches on the freeboard deck, and 18 inches on the superstructure deck. On Great Lakes vessels, the height from the deck to any point where water may gain access below deck, shall be at least 30 inches on the freeboard deck, 24 inches on the raised quarterdeck, and 12 inches above other superstructure decks. Where height of vent pipes on Great Lakes vessels may interfere with the working of the vessel a lower height may be approved provided the vent cap is properly protected. Barges in inland service need provide a height of not less than 6 inches. A lesser amount may be approved if evidence is provided to the Commandant that a particular vent has proven satisfactory in service.

(6) Satisfactory means, permanently attached, shall be provided for closing the openings of all vents, except that barges in inland service may be exempted. Acceptable means of closure are:

(i) A ball check valve where the ball float, normally in the open position, will float up and close under the action of a submerging wave. The valve shall be designed so that the effective clear discharge area through the valve with the float in the open position is not less than the inlet area of the vent pipe to which the valve is connected.

(ii) A hinged closure, either manual or automatic, normally open on the outlet of the return bend, which may be closed either by hand or by the force of a submerging wave.

(iii) Wooden plugs which may be inserted in the vent opening by hand during heavy weather and be removed when no longer needed.

(iv) Canvas hoods which may be installed over the vent opening and secured by line during heavy weather.

(v) Other suitable devices acceptable to the Commandant.

(7) Vent outlets from oil tanks shall be fitted with a single screen of corrosion-resistant wire, of at least 30 by 30 mesh, or two screens of at least 20 by 20 mesh, spaced not less than one half inch nor more than 1½ inches apart. The clear area through the mesh shall not be less than the internal unobstructed area of the required pipe.

(8) Where vents are provided with flame screens, the closure device shall be situated so as not to damage these screens.

(9) The diameter of each vent pipe shall not be less than 1½ inches for fresh water tanks, 2 inches for water ballast tanks and 2½ inches for fuel oil tanks.

(10) Where tanks may be filled by a pressure head exceeding that for which the tank is designed, the aggregate area of the vents in each tank shall be at least equal to the area of the filling line unless the tanks are protected by overflows, in which case the area of the overflow shall not be less than that of the filling line.

(11) Where deep tanks are intended for the occasional carriage of dry or liquid cargo, a "spectacle" or ring and blank flange may be fitted in the overflow pipe so arranged as not to interfere with venting when the tanks contain oil.

(12) Vents from fresh water or water ballast tanks shall not be connected to a common header with vents from oil or oily ballast tanks.

(R.S. 4405, as amended (46 U.S.C. 375); R.S. 4417, as amended (46 U.S.C. 391); 49 Stat. 1889 as amended (46 U.S.C. 391a); R.S. 4462 as amended (46 U.S.C. 416))

[CGFR 68-82, 33 FR 18843, Dec. 18, 1968, as amended by CGFR 72-59R, 37 FR 6189, Mar. 25, 1972; CGD 79-083, 45 FR 26712, Apr. 21, 1980]

§ 56.50-90 Sounding devices.

(a) All tanks shall be provided with a suitable means of determining liquid level. In lieu of sounding pipes, tanks for the carriage of Grade E or lower liquids which are separate from the hull may be provided with a reliable liquid level indicating device. Where such devices are attached to a tank containing combustible liquids, they shall be of a heat resistant material adequately protected from mechanical damage and shall be provided at the tank connections with devices which will automatically close in the event of rupture of the gage or gage lines. Except for main cargo tanks on tank vessels, all integral hull tanks and compartments, which are not at all times accessible under service conditions shall be fitted with sounding pipes.

(b) Where sounding pipes terminate below the freeboard deck on cargo vessels, they shall be fitted with gate valves. On passenger vessels, where sounding pipes terminate below the bulkhead deck, they shall be fitted with self-closing gate valves.

(c) The upper ends of sounding pipes terminating at the weather deck shall be closed by a screw cap or plug. Great Lakes dry cargo carriers may have the sounding pipes which service ballast water tanks terminate at least 4 inches above the deck if closure is provided by a tight fitting hinged cover making metal-to-metal contact with the hinge on the forward side. Positive means to secure these caps in the closed position shall be provided. No perforations or openings will be permitted throughout the length of a sounding pipe where fitted to oil tanks. Provision shall be made to prevent damage to the vessels' plating by the striking of the sounding rod.

(d) On mobile offshore drilling units where installation of sounding pipes may not be practicable for some tanks, alternate means of determining liquid level may be used if approved by the Commandant.

(Sec. 2, 87 Stat. 418 (46 U.S.C. 86); sec. 3, 82 Stat. 341, as amended (46 U.S.C. 367); R.S.

4405, as amended (46 U.S.C. 375); sec. 10, 35 Stat. 428 (46 U.S.C. 395); R.S. 4423, as amended (46 U.S.C. 400); R.S. 4429, as amended (46 U.S.C. 407); R.S. 4430, as amended (46 U.S.C. 408); 88 Stat. 423 (46 U.S.C. 411); R.S. 4434, as amended (46 U.S.C. 412); R.S. 4462, as amended (46 U.S.C. 416); sec. 1, 73 Stat. 475 (46 U.S.C. 481); sec. 4, 67 Stat. 462 (43 U.S.C. 1333(d)); sec. 6(b)(1), 80 Stat. 937 (49 U.S.C. 1655(b)(1)); 49 CFR 1.46 (b) and (n)(6))

[CGFR 68-82, 33 FR 18843, Dec. 18, 1968, as amended by CGD 73-251, 43 FR 56800, Dec. 4, 1978]

§ 56.50-95 Overboard discharges and shell connections.

(a) (1) All inlets and discharges led through the vessel's side shall be fitted with efficient and accessible means for preventing the accidental admission of water into the vessel either through such pipes or in the event of fracture of such pipes.

(2) The number of scuppers, sanitary discharges, tank overflows, and other similar openings in the vessel's side shall be reduced to a minimum, either by making each discharge serve for as many as possible of the sanitary and other pipes, or in any other satisfactory manner.

(3) In general, when the bulkhead deck is above the freeboard deck, the requirements of this section apply relative to the bulkhead deck. For vessels not assigned load lines, such as certain inland vessels and barges, the weather deck shall be taken as the freeboard deck.

(b) (1) Scuppers and discharge pipes originating at any level and penetrating the shell either more than 17½ inches (450 mm.) below the freeboard deck or less than 23½ inches (600 mm.) above the summer load waterline shall be provided with an automatic nonreturn valve at the shell. This valve, unless required by paragraph (b)(2) of this section may be omitted if the piping is not less than Schedule 80 in wall thickness through 8 inches nominal pipe size, Schedule 60 for nominal pipe sizes above 8 inches and below 16 inches, and Schedule 40 for pipe sizes above 16 inches.

(2) Discharges led through the shell originating either from spaces below the freeboard deck or from within enclosed superstructures and equivalent deckhouses on the freeboard deck as defined in § 42.13-15(i) of Subchapter E (Load Lines) of this chapter, shall be fitted with efficient and accessible means for preventing water from passing inboard. Normally each separate discharge shall have one automatic nonreturn valve with a positive means of closing it from a position above the freeboard deck. Where, however, the vertical upward distance from the summer load line to the inboard end of the discharge pipe through which flooding can take place exceed 0.01L, the discharge may have two automatic nonreturn valves without positive means of closing, provided that the inboard valve is always accessible for examination under service conditions. Where that vertical distance exceeds 0.02L a single automatic nonreturn valve without positive means of closing is acceptable. In an installation where the two automatic nonreturn valves are used, the inboard valve must be above the tropical load line. The means for operating the positive action valve shall be readily accessible and provided with an indicator showing whether the valve is open or closed. A suitable arrangement shall be made to insure the valve is not closed by unauthorized persons, and a notice shall be posted in a conspicuous place at the operating station to the effect that the valve shall not be closed except as required in an emergency.

(3) Where scuppers and drains are installed in superstructures or deckhouses not enclosed as defined in § 42.13-15(j) of Subchapter E (Load Lines) of this chapter, they shall be led overboard. Refer to paragraph (b)(1) of this section for any nonreturn valve requirement.

(4) Sanitary pump discharges leading directly overboard or via a holding tank must meet the standards prescribed by this paragraph. The location of the sanitary system openings within the vessel determines whether the requirements of paragraph (b)(2) or (3) of this section are applicable.

(c) Overflow pipes which discharge through the vessel's side shall be located as far above the deepest load line as practicable and shall be fitted with valves as required by paragraph

(b) of this section. Two automatic nonreturn valves shall always be used unless it is impracticable to locate the inboard valve in an accessible position, in which case a nonreturn valve with a positive means of closure from a position above the freeboard deck will be acceptable. Overflows which extend at least 30 inches above the freeboard deck before discharging overboard may be fitted with a single automatic nonreturn valve at the vessel's side. Overflow pipes may be vented to the weather.

(d)(1) Sea inlets and discharges, such as used in closed systems required for the operation of main and auxiliary machinery, as in pump connections or scoop injection heat exchanger connections, need not meet the requirements of paragraphs (b) (1) and (2) of this section but instead shall be fitted with a shutoff valve located as near the shell plating as practicable, and may be locally controlled if the valve is located in a manned machinery space. Such controls shall be readily accessible and shall be provided with indication showing whether the valve is open or closed.

(2) In unmanned machinery spaces, all machinery inlets and discharges as described in paragraph (d)(1) of this section shall be remotely operable from a position above the freeboard deck unless otherwise approved and shall meet the access and marking requirements of paragraph (b)(2) of this section.

(e) (1) Pipes terminating at the shell plating shall be fitted with bends or elbows between the outboard openings and the first rigid connection inboard. In no case shall such pipes be fitted in a direct line between the shell opening and the first inboard connection.

(2) Seachests and other hull fittings shall be of substantial construction and as short as possible. They shall be located as to minimize the possibility of being blocked or obstructed.

(3) The thickness of inlet and discharge connections outboard of the shutoff valves, and exclusive of seachests, shall be not less than that of Schedule 80 through 8 inches nominal pipe size, Schedule 60 for nominal pipe sizes above 8 inches and below 16 inches, and Schedule 40 for nominal pipe sizes above 16 inches.

(f) Valves required by this section and piping system components outboard of such required valves on new vessel installations or replacements in vessels of 150 gross tons and over shall be of a steel, bronze, or ductile cast iron specification listed in Table 56.60-1(a). Lead or other heat sensitive materials having a melting point of 1,700° F. or less shall not be used in such service, or in any other application where the deterioration of the piping system in the event of fire would give rise to danger of flooding. Brittle materials such as cast iron shall not be used in such service. Where nonmetallic materials are used in a piping system, and shell closures are required by this section, a positive closure metallic valve is required (see also § 56.60-25).

(g) The inboard openings of ash and rubbish-chute discharges shall be fitted with efficient covers. If the inboard opening is located below the freeboard deck, the cover shall be watertight, and in addition, an automatic nonreturn valve shall be fitted in the chute in any easily accessible position above the deepest load line. Means shall be provided for securing both the cover and the valve when the chute is not in use. When ash-ejectors or similar expelling devices located in the boilerroom have the inboard openings below the deepest load line, they shall be fitted with efficient means for preventing the accidental admission of water. The thickness of pipe for ash ejector discharge shall be not less than Schedule 80.

(h) Where deck drains, soil lines, and sanitary drains discharge through the shell in way of cargo tanks on tank vessels, the valves required by this section shall be located outside the cargo tanks. These valves shall meet the material requirements of paragraph (f) of this section. The piping led through such tanks shall be fitted with expansion bends where required, and shall be of steel pipe having a wall thickness of not less than five-eighths inch, except that the use of suitable corrosion-resistant material of lesser thickness will be given special consideration by the Commandant. All pipe joints within the tanks shall be welded. Soil lines and sanitary drains which pass through cargo tanks shall be provided with nonreturn valves with positive means of closing or other suitable means for preventing the entrance of gases into living quarters.

[CGFR 68-82, 33 FR 18843; Dec. 18, 1968, as amended by CGFR 69-127, 35 FR 9979, June 17, 1970; CGFR 72-59R, 37 FR 6189, Mar. 25, 1972]

§ 56.50-96 Keel cooler installations.

(a) Keel cooler installations shall meet the requirements of §§ 56.50-95(d)(1) and (2), and (e)(3), and (f) except that shutoff or isolation valves will not be required for the inlet and discharge connections if:

(1) The installation is forward of the collision bulkhead; or,

(2) The installation is integral with the ship's hull such that the cooler tubes are welded directly to the hull of the vessel with the hull forming part of the tube and satisfies all of the following:

(i) The cooler structure is fabricated from material of the same thickness and quality as the hull plating to which it is attached except that in the case of half round pipe lesser thickness may be used if specifically approved by the Commandant. In any case the structure, with the exception of the hull proper, need not exceed three-eighths inch in thickness.

(ii) The flexible connections in such systems are above the deepest load line.

(iii) Full penetration welds are employed in the fabrication of the structure and its attachment to the hull.

(iv) The forward end of the structure is faired to the hull with a slope no greater than 4 to 1.

[CGFR 68-82, 33 FR 18843, Dec. 18, 1968, as amended by CGFR 72-59R, 37 FR 6189, Mar. 25, 1972]

§ 56.50-97 Instrument, control and sampling piping (modifies 122.3).

(a) Instrument, control and sampling piping must comply with paragraph 122.3 of ANSI-B31.1 except that:

(1) Soldered type fittings may not be used.

(2) The outside diameter of takeoff connections may not be less than 0.840 inches for service conditions up to 900 psi or 800° F., and 1.050 inches for conditions that exceed either of these limits.

[CGFR 68-82, 33 FR 18843, Dec. 18, 1968, as amended by CGFR 69-127, 35 FR 9978, June 17, 1970; CGD 73-254, 40 FR 40165, Sept. 2, 1975]

§ 56.50-100 Fluid power and control systems (hydraulic and pneumatic).

(a) Requirements for fluid power and fluid control systems are in Subpart 58.30 of this subchapter.

§ 56.50-101 Refrigeration systems.

(a) Requirements for refrigeration systems are in Subpart 58.20 of this subchapter.

§ 56.50-102 Liquefied petroleum gas for cooking and heating.

(a) Requirements for liquefied petroleum gas systems for cooking and heating are in Subpart 58.16 of this subchapter.

§ 56.50-105 Low temperature piping.

(a) *Class I-L.* Piping systems designated to operate at temperatures below 0° F. and pressures above 150 pounds per square inch gage shall be of Class I-L. Exceptions to this rule may be found in the individual requirements for specific commodities in Subchapters D, I, and O of this chapter. The following requirements for Class I-L piping systems shall be satisfied:

(1) *Materials.* All materials used in low temperature piping systems shall be selected from among those specifications listed in Table 56.50-105 and shall satisfy all of the requirements of the specifications, except that:

(i) The minimum service temperature as defined in § 54.25-10(a)(2) of this subchapter shall not be colder than that shown in Table 56.50-105; and

(ii) The material shall be tested for low temperature toughness using the Charpy V-notch specimen of ASTM E-23, "Notched Bar Impact Testing of Metallic Materials", Type A, Figure 4. The toughness testing requirements of Subpart 54.05 of this subchapter shall be satisfied for each particular product form. Charpy V-notch tests shall be conducted at temperatures not warmer than 10° F. below the minimum service temperature of the design, except that for service temperatures of —320° F. and below, the impact test may be conducted at the service temperature. The minimum average energy shall not be less than that shown in Table 56.50-105. In the case of steels conforming to the specifications of Table 54.25-20(a) of this subchapter the minimum lateral expansion shall not be less than that required in § 54.25-20 of this subchapter. The minimum energy permitted for a single specimen and the minimum subsize energies shall be those obtained by multiplying the average energy shown in Table 56.50-105 by the applicable fraction shown in Table 56.50-105(a).

TABLE 56.50-105(a).—CHARPY V-NOTCH ENERGY MULTIPLYING FACTORS

Charpy V-notch specimen size [1]	Factor for minimum energy, average of 3 specimens [1]	Factor for minimum energy single specimen [1]
10×10 mm	1	2/3
10×7.5 mm	5/6	5/9
10×5.0 mm	2/3	4/9
10×2.5 mm	1/2	1/3

[1] Straight line interpolation for intermediate values is permitted.

(iii) Steels equivalent to those listed in Table 56.50-105, but not produced according to a particular ASTM specification, may be used only with the prior consent of the Commandant. Steels differing in chemical composition, mechanical properties or heat treatments from those specified may be specially approved by the Commandant. Similarly, aluminum alloys and other nonferrous materials not covered in Table 56.50-105 may be specially considered by the Commandant for service at any low temperature.

(2) *Piping weldments.* Piping weldments shall be fabricated to satisfy the requirements of § 57.03-1(b) of this subchapter in addition to Subpart 56.70. Toughness testing of production weldments for low temperature piping systems and assemblies is not required.

(3) *Postweld heat treatment.* All piping weldments shall be postweld heat treated for stress relief in accordance with the procedures of Subpart 56.85. The only exceptions to this requirement are for materials which do not require postweld heat treatment as shown in Table 56.85-10. Relief from postweld heat treatment shall not be dependent upon pipe thickness or weld joint type.

(4) *Nonacceptable joints.* Single welded butt joints with backing ring left in place, socket welds, slip-on flanges, pipe joining sleeves, and threaded joints shall not be used, except in small diameter instrument lines.

(5) *Other requirements.* All other requirements contained in this part for Class I piping apply to Class I-L systems. Pressure testing must comply with Subpart 56.97 and nondestructive testing of circumferentially welded joints must comply with Table 56.95-10. Seamless grade tubular products must be used except, when the service pressure does not exceed 250 p.s.i., the Commandant may give special consideration to appropriate grades of pipe and tubing that are welded without the addition of filler metal in the root pass. Production procedures and quality control programs for welded products must be accepted by the Commandant.

(b) *Class II-L.* Piping systems designed to operate at temperatures below 0° F. and pressures not higher than 150 pounds per square inch gage shall be of Class II-L. Exceptions to this rule may be found in the individual requirements for specific commodities in Subchapter D (Tank Vessels) and I (Cargo and Miscellaneous Vessels) of this chapter. The following requirements for Class II-L piping systems shall be satisfied:

(1) Materials must be the same as those required by paragraph (a)(1) of this section except that pipe and tubing of appropriate grades welded without the addition of a filler metal may be used. The Commandant may give special consideration to tubular products welded with the addition of filler metal.

(2) Piping weldments shall be fabricated to satisfy the requirements of

§ 57.03-1(b) of this subchapter in addition to Subpart 56.70. Toughness testing of production weldments for low temperature piping systems and assemblies is not required.

(3) All piping weldments shall be postweld heat treated for stress relief in accordance with the procedures of Subpart 56.85. The only exceptions to this requirement are for materials which do not require postweld heat treatment as shown in Table 56.85-10 and for socket weld joints and slip-on flange weld attachments where the weld thickness does not exceed that exempted by this table. Otherwise, relief from post-weld heat treatment shall not be dependent upon pipe thickness or weld joint type.

(4) Socket welds in nominal sizes above 3 inches, slip-on flanges in nominal sizes above 4 inches, and threaded joints in sizes above 1 inch shall not be used.

(5) Pressure testing shall comply with Subpart 56.97 and nondestructive testing of welded joints shall comply with Table 56.95-10.

(6) All other requirements contained in this part for Class II piping shall be applicable to Class II-L systems, except that § 56.70-15(b)(3)(iv) shall not apply.

TABLE 56.50–105—ACCEPTABLE MATERIALS AND TOUGHNESS TEST CRITERIA [2]

Product form	ASTM specification	Grade	Minimum service temperature	Minimum average Charpy V-notch energy
Pipe Tube (carbon and low alloy steels).	A-333 and A-334	1	−30° F	20 ft. lb.
		3	−150° F	25 ft. lb.
		4 (A-333 only)	−100° F	25 ft. lb.
		6	−30° F	20 ft. lb.
		7	−100° F	25 ft. lb.
		8	−320° F	Refer to § 54.25-20 of this subchapter.
Pipe (Austenitic stainless steel)	A-312	All Grades	No limit	Austenitic stainless steel piping need be impact tested only when toughness tests are specified in Subpart 54.25 of this subchapter for plating of the same alloy designation. When such toughness tests are required, the minimum average energy is 25 ft. lb.
Wrought welding fittings (carbon and low alloy steels).	A-420	WPL1	−30° F	20 ft. lb.
		WPL3	−150° F	25 ft. lb.
		WPL4	−100° F	25 ft. lb.
Forged or rolled flanges, forged fittings, valves and pressure parts (carbon and low alloy steels).	A-350 [1]	LF1	−30° F	20 ft. lb.
		LF2	−30° F	20 ft. lb.
		LF3	−150° F	25 ft. lb.
		LF4	−100° F	25 ft. lb.
Forged or rolled flanges, forged fittings, valves and pressure parts (high alloy steels).	A-182	Austenitic grades only (304, 304H, 304L, 310, 316, 316H, 316L, 321, 321H, 347, 347H, 348, 348H).	No limit	These products need be impact tested only when toughness tests are specified in Subpart 54.25 of this subchapter for plating of the same alloy designation. When such toughness tests are required, the minimum average energy is 25 ft. lb.
Forged flanges, fittings, and valves (9% nickel).	A-522	9% Ni	−320° F	Refer to § 54.25-20 of this subchapter.
Castings for valves and pressure parts (carbon and low alloy steels).	A-352 [1]	LCB	−30° F	20 ft. lb.
		LC1	−50° F	20 ft. lb.
		LC2	−100° F	25 ft. lb.
		LC3	−150° F	25 ft. lb.

TABLE 56.50-105—ACCEPTABLE MATERIALS AND TOUGHNESS TEST CRITERIA [2]—Continued

Product form	ASTM specification	Grade	Minimum service temperature	Minimum average Charpy V-notch energy
Castings for valves and pressure parts (high alloy steel).	A-351	Austenitic grades CF3, CF3A, CF8, CF8A, CF3M, CF8M, CF8C, CK20 only.	No limit, except −325° F for grades CF8C and CK20.	No toughness testing required except for service temperatures colder than −425° F for grades CF3, CF3A, CF8, CF8A, CF3M, and CF8M. 25 ft. lb. average must be attained in these tests.
Bolting	A-320	L7, L9, L10, L43	−150° F	20 ft. lb.
		B8D, B8T, B8F, B8M	−325° F	No test required.
		2B8, B8C	No limit	No test required, except for service temperatures colder than −425° F. In such case the minimum average energy is 25 ft. lb.
Nuts, bolting	A-194	4	−150° F	20 ft. lb.
		8T, 8F	−325° F	No test required.
		8	No limit	Same requirement as comparable grades (B8, B8C) of bolting listed above.
		8C		

[1] Quench and temper heat treatment may be permitted when specifically authorized by the Commandant. In those cases the minimum average Charpy V-notch energy shall be specially designated by the Commandant.

[2] Other material specifications for product forms acceptable under Part 54 for use at low temperatures may also be used for piping systems provided the applicable toughness requirements of this Table are also met.

(5 U.S.C. 552; 14 U.S.C. 633; 92 Stat. 1480 (Port and Tanker Safety Act of 1978, 46 U.S.C. 391(a); 49 CFR 1.46(n)(4))

[CGFR 68-82, 33 FR 18843, Dec. 18, 1968, as amended by CGFR 72-59R, 37 FR 6189, 6190, Mar. 25, 1972; CGD 73-254, 40 FR 40165, Sept. 2, 1975; CG 79-108, 43 FR 46545, Oct. 10, 1978; CGD 74-289, 44 FR 26008, May 3, 1979]

§ 56.50-110 Diving support systems.

(a) In addition to the requirements of this part, piping for diving installations which is permanently installed on the vessel must meet the requirements of Subpart B (Commercial Diving Operations) of Part 197 of this chapter.

(b) Piping for diving installations which is not permanently installed on the vessel need not meet the requirements of this part, but must meet the requirements of Subpart B of Part 197 of this chapter.

(c) Piping internal to a pressure vessel for human occupancy (PVHO) need not meet the requirements of this part, but must meet the requirements of Subpart B of Part 197 of this chapter.

(46 U.S.C. 239; 46 U.S.C. 390b; 46 U.S.C. 391a; 33 U.S.C. 1509(b); 43 U.S.C. 1333(d)(1); 43 U.S.C. 1331 et seq., as amended by Sec. 203 and 208 of Pub. L. 95-372; 46 U.S.C. 395; 46 U.S.C. 375; 46 U.S.C. 391; 46 U.S.C. 392; 46 U.S.C. 416; 49 U.S.C. 1655(b); 49 CFR 1.46 (b) and (s))

[CGD 76-009, 43 FR 53683, Nov. 16, 1978]

Subpart 56.60—Materials

§ 56.60-1 Acceptable materials and specifications (replaces § 123 and modifies Table 126.1 in ANSI-B31.1).

(a)(1) The material requirements in this subpart shall be followed in lieu of those in 123 in ANSI-B31.1.

(2) Materials used in piping systems shall be selected from the specifications which appear in Table 56.60-1(a) or Table 56.60-2(a), or they may be selected from the material specifications of section I, III, or VIII of the ASME Code if not prohibited by a regulation of this subchapter dealing with the particular section of the ASME Code. Table 56.60-1(a) contains only pipe, tubing, and fitting specifications. Other product forms appearing in Table 126.1 of ANSI-B31.1 are not listed here. Determination of acceptability of plate, forging, bolting, nuts, and castings may be made by refer-

ence to the ASME Code as previously described. Additionally accepted materials for use as piping system components appear in Table 56.60-2(a). Other materials must receive the specific approval of the Commandant before being used.

(b) Acceptable commercial standards applicable to piping systems appear in Table 56.60-1(b).

TABLE 56.60-1(a)—ADOPTED SPECIFICATIONS AND STANDARDS (MODIFIES TABLE 126.1)

NOTE: This Table 56.60-1(a) identifies the acceptable pipe, tubing, and fitting specifications intended for piping system use and it modifies Table 126.1 in USAS-B31.1. Piping system applications will be considered if certification of physical testing is furnished. Without this certification, use is limited to applications inside heat exchangers that insure containment of the material inside a pressure shell.

ASTM specification	Source of allowable stress values	Notes
Pipe, seamless:		
A106 Carbon steel	ANSI-B31.1	
A335 Ferritic alloys	ANSI-B31.1	
A376 Austenitic alloys	ANSI-B31.1	([1]).
Pipe, seamless and welded:		
A53 Types S, F, and E steel pipe	ANSI-B31.1	([2, 3, 4]).
A312 Austenitic steel (welded with no filler metal)	ANSI-B31.1	([1, 4]).
A333 Low temperature steel pipe	Sec. VIII, ASME Code	([5]).
Pipe, welded:		
A72 Welded wrought iron pipe	ANSI-B31.1	([4, 6]).
A134 Fusion welded steel plate pipe	See footnote 7	([7]).
A135 ERW pipe	ANSI-B31.1	([3]).
A139 Grade B only, fusion welded steel pipe	ANSI-B31.1	([8]).
A155 Electric fusion welded pipe, high temperature, ferritic and low alloy.	ANSI-B31.1	([4, 9]).
A358 Electric fusion welded pipe, high temperature, austenitic.	ANSI-B31.1	([1, 4, 9]).
Pipe, forged and bored:		
A369 Ferritic alloy	ANSI-B31.1	
A430 Austenitic alloy	ANSI-B31.1	([1]).
Pipe, centrifugally cast:		
(None acceptable)	None applicable	
Tube, seamless:		
A179 Carbon steel heat exchanger and condenser tubes	UCS23, Sec. VIII, ASME Code	([11]).
A192 Carbon steel boiler tubes	PG23.1, Sec. I, ASME Code	([10]).
A199 Alloy steel condenser tubes	UCS23, Sec. VIII, ASME Code	
A210 Medium carbon boiler tubes	PG23.1, Sec. I, ASME Code	
A213 Ferritic and austenitic boiler tubes	PG23.1, Sec. I, ASME Code	([1]).
Tube, seamless and welded:		
A268 Seamless and ERW ferritic stainless tubing	PG23.1, Sec. I, ASME Code	([4]).
A334 Seamless and welded (no added filler metal) carbon and low alloy tubing for low temperature.	UCS23, Sec. VIII, ASME Code	([4, 5]).
Tube, welded:		
A178 (Grades A and C only) ERW boiler tubes	PG23.1, Sec. I, ASME Code	([10] Grade A) ([4]).
A214 ERW heat exchanger and condenser tubes	UCS27, Sec. VIII, ASME Code	
A226 ERW boiler and superheater tubes	PG23.1, Sec. I, ASME Code	([4, 10]).
A249 Welded austenitic boiler and heat exchanger tubes (no added filler metal).	PG23.1, Sec. I, ASME Code	([1, 4]).
Wrought fittings (factory made):		
A234 Carbon and ferritic alloys	Conforms to applicable American National Standards (ANSI-B16.9 and ANSI-B16.11).	([12]).
A403 Austenitic alloys	do	([12]).
A420 Low temperature carbon and steel alloy	do	([12]).
Castings,[13] iron:		
A47 Malleable iron	Conform to applicable American National Standards or refer to UCI-23 or UCD-23, Sec. VIII, ASME Code.	([14]).
A445 Ductile iron	do	([14]).
A126 Gray iron	do	([14]).
A197 Malleable iron	do	([14]).
A395 Ductile iron	UCD-23, Sec. VIII, ASME Code	([14]).
	NONFERROUS MATERIALS [15]	
Pipe, seamless:		
B42 Copper	UNF23, Sec. VIII, ASME Code	([16]).
B43 Red brass	do	

TABLE 56.60-1(a)—ADOPTED SPECIFICATIONS AND STANDARDS (MODIFIES TABLE 126.1)—Continued

ASTM specification	Source of allowable stress values	Notes
B241 Aluminum alloy	do	
Pipe and tube, seamless:		
B161 Nickel	do	
B165 Nickel-copper	do	
B167 Ni-Cr-Fe	do	
B315 Copper-silicon	do	
Tube, seamless:		
B68 Copper	See footnote 17	(16, 17, 18).
B75 Copper	UNF23, Sec. VIII, ASME Code	(16).
B88 Copper	See footnote 17	(16, 17).
B111 Copper and copper alloy	UNF23, Sec. VIII, ASME Code	
B210 Aluminum alloy, drawn	do	
B234 Aluminum alloy, drawn	do	
B280 Copper tube for refrigeration service	See footnote 17	(16, 17).
Welding fittings:		
B361 Wrought aluminum welding fittings	Shall meet ANSI Standards	

ASTM specification	Minimum tensile	Longitudinal joint efficiency	P No.	Allowable stresses (p.s.i.)
A134:				
Grade 285A	45,000	0.80	1	11,250×0,8=9,000.
Grade 285B	50,000	0.80	1	12,500×0,8=10,000.
Grade 285C	55,000	0.80	1	13,750×0,8=11,000.

NOTE: When using 104.1.2 in ANSI-B31.1 to compute wall thickness, the stress shown here shall be applied as though taken from the stress tables. An additional factor of 0.8 may be required by § 56.07-10(c) and (e).

[1] For austenitic materials where two sets of stresses appear, use the lower values.

[2] Type F (Furnace welded, using open hearth, basic oxygen, or electric furnace only) limited to Class II applications with a maximum service temperature of 450° F. Type E (ERW grade) limited to maximum service temperature of 650° F, or less.

[3] Electric resistance welded pipe or tubing of this specification may be used to a maximum design pressure of 350 pounds per square inch gage.

[4] Refer to limitations on use of welded grades given in § 56.60-2(b).

[5] Use generally considered for Classes I-L and II-L applications. For Class I-L service only, the seamless grade is permitted. For other service refer to footnote 4 and to § 56.50-105.

[6] Furnace lap or furnace butt grades only. Limited to Class II applications only where the maximum service temperature is 450° F, or less.

[7] Limited to Grades 285A, 285B, and 285C only (straight and spiral seam). Limited to Class II applications only where maximum service temperature is 300° F or less for straight seam, and 200° F or less for spiral seam.

[8] Limited to Class II applications where the maximum service temperature is 300° F or less for straight seam and 200° F or less for spiral seam.

[9] For Class I applications only the Class I Grade of the specification may be used.

[10] When used in piping systems, a certificate shall be furnished by the manufacturer certifying that the mechanical properties at room temperature specified in ASTM A520 have been met. Without this certification, use is limited to applications within heat exchangers.

[11] When used in piping systems, a certificate shall be furnished by the manufacturer certifying that the mechanical properties for A192 in ASTM A520 have been met. Without this certification, use is limited to applications within heat exchangers.

[12] Hydrostatic testing of these fittings is not required but all fittings shall be capable of withstanding without failure, leakage, or impairment of serviceability, a hydrostatic test of 1½ times the designated rating pressure.

[13] Other acceptable iron castings are in UCI-23 and UCD-23 of section VIII of the ASME Code. (See also §§ 56.60-10 and 56.60-15.) Acceptable castings of materials other than cast iron may be found in section I or VIII of the ASME Code.

[14] Acceptable when complying with American National Standards. Ductile iron is acceptable for temperatures not exceeding 650° F. For pressure temperature limitations refer to UCD-3 of section VIII of the ASME Code. Other grades of cast iron are acceptable for temperatures not exceeding 450° F. For pressure temperature limitations refer to UCI-3 of section VIII of the ASME Code.

[15] For limitations in use refer to §§ 56.10-5(c) and 56.60-20.

[16] Copper pipe shall not be used for hot oil systems except for short flexible connections at burners. Copper pipe shall be annealed prior to installation in Class I piping systems. See also § 56.10-5(c) of this chapter and § 56.00-20.

[17] The stress values shall be taken from UNF23 of section VIII of the ASME Code for B75 annealed and light drawn temper as appropriate.

[18] B68 shall be acceptable if provided with a mill hydrostatic or eddy current test.

TABLE 56.60-1(b)—ADOPTED STANDARDS APPLICABLE TO PIPING SYSTEMS (MODIFIES TABLE 126.1)

ANSI Standards (American National Standards Institute), 1430 Broadway, New York, N.Y. 10018.

B1.1	Unified Screw Threads.
B2.1	Pipe Threads.
B2.2	Dryseal Pipe Threads.
B16.1	C.I. Flanges & Fittings—125 lb.
B16.3	M.I. Threaded Fittings—150 & 300 lb.
B16.4	C.I. Threaded Fittings—125 & 250 lb.
B16.5	Steel Pipe Flanges and Flanged Fittings.
B16.9	Steel-Butt-Welding Fittings.
B16.10	Dimensions of Ferrous Valves.
B16.11	Steel S.W. and Threaded Fittings.
B16.14	Ferrous-Threaded-Plugs-Bushings & Locknuts.
B16.15	Cast Bronze Threaded Fittings—125 & 250 lb.
B16.18	Cast Brass Solder-Joints.
B16.20	Ring Joint Gaskets—Steel Flanges.
B16.21	Non-metallic Gaskets for Flanges.
B16.22	Wrought Copper & Bronze Solder Joints Fittings.
B16.23	Cast-Bronze Solder-Joint Drainage Fittings.
B16.24	Brass or Bronze Flanges & Fittings—150 & 300 lb.
B16.25	Butt Welding Ends--Pipe, Valves, Flanges, & Fittings.
B16.28	Wrought Steel Buttwelding Short Radius Elbows and Returns.
B16.29	Wrought-Copper and Wrought-Copper Alloy Solder-Joint Drainage Fittings.
B18.2	Square and Hexagon Bolts and Nuts.
B36.10	Wrought-Steel & Iron Pipe.
B36.19	Stainless Steel Pipe.

MSS Standards (Manufacturers' Standardization Society of the Valve and Fittings Industry), 1815 North Fort Myer Drive, Arlington, Va. 22209.

SP-6	Finishes-On Flanges, Valves & Fittings.
SP-9	Spot-Facing.
SP-25	Marking for Valves, Fittings, Flanges & Unions.
SP-37	Bronze Gate Valves—125 lb.[1]
SP-42	Cast Flanged Valves—150 lb.
SP-44	Steel Pipe Line Flanges.
SP-45	Bypass and Drain Connection.
SP-51	Cast Flanges & Fittings—150 lb.
SP-53	Magnetic Particle Inspection—Steel Castings.
SP-55	Visual Inspection—Steel Castings.
SP-58	Pipe Hangers & Supports.
SP-61	Hydrostatic Testing Steel Valves.
SP-66	Pressure-Temperature Ratings for Steel Butt Welding End Valves.
SP-67	Butterfly Valves.[2]
SP-69	Pipe Hangers and Supports—Selection and Application.
SP-72	Ball Valves with Flanged or Butt-Welding Ends for General Service.
SP-73	Silver Brazing Joints for Wrought and Cast Solder Joint Fittings.

FCI Standards (Fluid Controls Institute, Inc., 12 Bank Street, Summit, New Jersey, 07901): FCI 69-1 Pressure Rating Standard for Steam Traps.

[1] In addition, adequacy of body shell thickness shall be satisfactory to the Commandant.

[2] In addition, see footnote 1 for bronze-valves, and refer to § 56.60-10 for cast iron valves.

[CGFR 68-82, 33 FR 18843, Dec. 18, 1968, as amended by CGFR 69-127, 35 FR 9978, June 17, 1970; CGFR 72-59R, 37 FR 6190, Mar. 25, 1972; CGD 72-206R, 38 FR 17229, June 29, 1973; CGD 73-248, 39 FR 30839, Aug. 26, 1974; CGD 73-254, 40 FR 40165, Sept. 2, 1975]

§ 56.60-2 Limitations on materials.

(a) *Stresses.* The maximum stress in the materials listed in Table 56.60-1(a) must be 80 percent of the value contained in the designated source of allowable stress values, unless the dynamic effect is accounted for in the design in accordance with the requirement contained in § 56.07-10(c) of this chapter. Further limitations on allowable stress values are contained in 56.07-10 (c) and (e). Italicized values of stress in referenced specifications shall not be used.

(b) *Welded pipe and tubing.* The following restrictions apply to the use of welded pipe and tubing specifications when utilized in piping systems, and not when utilized in heat exchanger, boiler, pressure vessel, or similar components:

(1) *Longitudinal joint.* Wherever possible, the longitudinal joint of a welded pipe shall not be pierced with holes for branch connections or other purposes.

(2) *Class II.* Use unlimited except as restricted by maximum temperature or pressure specified in Table 56.60-1(a) or by the requirements contained in § 56.10-5(b) of this chapter.

(3) *Class I.* (i) For those specifications in which a filler metal is used, the following applies to the material as furnished prior to any fabrication:

(*a*) For use in service above 800° F. full welding procedure qualifications by the Coast Guard are required. See Part 57 of this subchapter.

(*b*) Ultrasonic examination as required by item S-6 in ASTM A-376 shall be certified as having been met in all applications except where 100 percent radiography is a requirement of the particular material specification.

(ii) For those specifications in which no filler metal is used in the welding process, the following applies:

(*a*) Ultrasonic examination as required by item S-6 in ASTM A-376 shall be certified as having been met for service above 800° F.

NOTE: There are additional requirements for nuclear and low temperature piping systems in this subchapter.

TABLE 56.60-2(a)—ADOPTED SPECIFICATIONS NOT LISTED IN THE ASME CODE

ASTM specifications	Source of allowable stress	Notes
FERROUS MATERIALS [1]		
Bar stock:		
A276 (Grades 304-A, 304L-A, 310-A, 316-A, 316L-A, 321-A, 347-A, and 348-A).	See footnote 4	(4).
A575 and A576 (Grades 1010-1030).	See footnote 2	(2 3).
NONFERROUS MATERIALS		
Bar stock:		
B16 (soft and half hard tempers).	See footnote 5	(5, 7).
B21 (alloys A, B, and C).	See footnote 8	(8).
B124:		
Alloy 377	See footnotes 5 and 9.	(5, 9).
Alloy 464	See footnote 8	(8, 10).
Alloy 655	See footnote 11	(11).
Alloy 642	See footnote 12	(7, 12).
Alloy 630	See footnote 13	(7, 13).
Alloy 485	See footnote 8	(8, 10).
Forgings:		
B283 (forging brass)	See footnotes 5 and 9.	(5, 9).
Castings:		
B26	See footnotes 5, 14, and 15.	(5, 14, 15, 16).
B85	See footnotes 5, 14, and 15.	(5, 14, 15, 16).

[1] For limitations in use refer to § 56.60-5.

[2] Allowable stresses shall be the same as those listed in UCS23 of section VIII of the ASME Code for SA-306 material of equivalent tensile strength.

[3] Physical testing shall be performed as for material manufactured to ASME Specification SA-306, except that the bend test shall not be required.

[4] Allowable stresses shall be the same as those listed in UCS23 of section VIII of the ASME Code for the corresponding SA-182 material.

[5] Limited to air and hydraulic service with a maximum design temperature of 150° F. The fluid being piped shall not be salt water or otherwise corrosive.

[6] [Reserved]

[7] A mercurous nitrate test, in accordance with ASTM B154, shall be performed on a representative model of each finished product design.

[8] Allowable stresses shall be the same as those listed in UNF23 of section VIII of the ASME Code for SB-171, naval brass.

[9] A mercurous nitrate test, in accordance with ATMS B154, shall be performed on a representative model for each finished product design. Tension tests shall be performed to determine tensile strength, yield strength, and elongation. Minimum values shall be those listed in Table IV of ASTM B283.

[10] Physical testing, including mercurous nitrate test, shall be performed as for material manufactured to ASTM B21.

[11] Physical testing shall be performed as for material manufactured to ASTM B96. Allowable stresses shall be the same as those listed in UNF23 of section VIII of the ASME Code for SB-96 and shall be limited to a maximum allowable temperature of 212° F.

[12] Physical testing shall be performed as for material manufactured to ASTM B171, alloy D. Allowable stresses shall be the same as those listed in UNF23 of section VIII of the ASME Code for SB-171, aluminum bronze D.

[13] Physical testing shall be performed as for material manufactured to ASTM B171, alloy E. Allowable stresses shall be the same as those listed in UNF23 of section VIII of the ASME Code for SB-171, aluminum bronze, alloy E.

[14] Tension tests shall be performed to determine tensile strength, yield strength, and elongation. Minimum values shall be those listed in Table III of ASTM B85.

[15] Those alloys with a maximum copper content of 0.6 percent or less shall be acceptable under this specification. Cast aluminum shall not be welded or brazed.

[16] Valves and fittings constructed of materials with an elongation less than 10 percent in a 2-inch specimen, and intended for pressure service in excess of 150 pounds per square inch, shall undergo the high impact shock test required in § 58.30-17.

Note: This Table 56.60-2(a) is a listing of adopted bar stock and nonferrous forging and casting specifications not listed in the ASME Code. Particular attention should be given to the supplementary testing requirements and service limitations contained in the footnotes.

[CGFR 68-82, 33 FR 18843, Dec. 18, 1968, as amended by CGFR 69-127, 35 FR 9978, June 17, 1970; CGD 72-104R, 37 FR 14233, July 18, 1972; CGD 73-248, 39 FR 30839, Aug. 26, 1974; CGD 73-254, 40 FR 40165, Sept. 2, 1975]

§ 56.60-3 Ferrous materials.

(a) Ferrous pipe used for salt water service must be protected against corrosion by hotdip galvanizing or by the use of extra heavy schedule material.

(b) (Reproduces 123.2.3(c)). Carbon or alloy steel having a carbon content of more than 0.35 percent may not be used in welded construction or be shaped by oxygen cutting process or other thermal cutting process.

[CGD 73-254, 40 FR 40165, Sept. 2, 1975]

§ 56.60-5 Steel (High temperature applications).

(a) (Reproduces 123.2.3(a).) Upon prolonged exposure to temperatures above 775° F., the carbide phase of plain carbon steel, plain nickel alloy steel, carbon-manganese alloy steel, manganese-vanadium alloy steel, and carbon-silicon steel may be converted to graphite.

(b) (Reproduces 123.2.3(b).) Upon prolonged exposure to temperatures above 875° F., the carbide phase of alloy steels, such as carbon-molybdenum, manganese-molybdenum-vanadium, manganese-chromium-vanadium and chromium-vanadium, may be converted to graphite.

(c) [Reserved]

(d) The design temperature of a piping system employing one or more of the materials listed in paragraphs (a), (b), and (c) of this section shall not exceed the lowest graphitization temperature specified for materials used.

[CGFR 68-82, 33 FR 18843, Dec. 18, 1968, as amended by CGFR 69-127, 35 FR 9978, June 17, 1970; CGD 72-104R, 37 FR 14233, July 18, 1972; CGD 73-248, 39 FR 30839, Aug. 26, 1974; CGD 73-254, 40 FR 40165, Sept. 2, 1975]

§ 56.60-10 Cast iron and malleable iron.

(a) The low ductility of cast iron and malleable iron should be recognized and the use of these metals where shock loading may occur should be avoided. Cast iron and malleable iron fittings conforming to the specifications of Table 56.60-1(a) may be used at pressures not exceeding the limits of the applicable standards of Table 56.60-1(b) at temperatures not exceeding 450° F. Valves of this material may be used in conformance with the standards for flanges and flanged fittings. ANSI-B16.1 if such service does not exceed the rating as marked on the valve.

(b) Cast iron and malleable iron shall not be used for valves or fittings in lines carrying flammable or combustible fluids[1] which are directly connected to, or in the proximity of, equipment or other lines having open flame, or any parts operating at temperatures above 500° F. Cast iron shall not be used for hull fittings, or in systems conducting lethal products.

(c) Malleable iron and cast iron valve and fittings, designed and marked for Class 300 refrigeration service may be used for such service, provided the pressure limitation of 300 pounds per square inch is not exceeded. Malleable iron flanges of this class may also be used in sizes 4 inches and smaller (oval and square design).

(d) The use of cast iron in certain hydraulic fluid power systems is described in § 58.30-15(f) of this chapter.

[CGFR 68-82, 33 FR 18843, Dec. 18, 1968, as amended by CGFR 69-127, 35 FR 9978, June 17, 1970; CGD 73-254, 40 FR 40165, Sept. 2, 1975]

§ 56.60-15 Ductile iron.

(a) Ductile cast iron components made of material conforming to ASTM A445 and A395 may be used under the following conditions:

(1) Components whose dimensions conform to ANSI-B16.1, and B16.5 may be used at the adjusted ratings for ductile iron components given in Appendix E of ANSI-B31.1.

(2) Welding shall not be used, either in fabrication of the components or in their assembly as a part of a piping system.

(3) Ductile iron castings shall be tested after machining to the hydrostatic shell test pressure specified in Appendix E of ANSI-B31.1, and shall show no leaks.

(b) The use of cast iron in certain hydraulic fluid power systems is described in § 58.30-15(f) of this chapter.

[CGFR 68-82, 33 FR 18843, Dec. 18, 1968, as amended by CGFR 69-127, 35 FR 9978, June 17, 1970; 35 FR 12205, July 30, 1970; CGD 73-254, 40 FR 40165, Sept. 2, 1975]

§ 56.60-20 Nonferrous materials.

(a) Nonferrous materials listed in this subpart may be used in piping systems under the following conditions (see also § 56.10-5(c)):

(1) The low melting points of aluminum and aluminum alloys must be recognized. These materials shall not be used to conduct flammable, combustible, or dangerous fluids,[2] or for vital systems unless authorized by the Commandant.

(2) The possibility of galvanic corrosion due to the relative solution potentials of copper and aluminum and their alloys should be considered when used in conjunction with each other or with steel or with other metals and

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[1] For definitions of flammable or combustible fluids, see §§ 30.10-15 and 30.10-22 of Subchapter D (Tank Vessels) of this chapter.

[2] For definitions of flammable or combustible fluids, see §§ 30.10-15 and 30.10-22 of Subchapter D (Tank Vessels) of this chapter. Dangerous fluids are those covered by regulations in Part 98 of Subchapter I (Cargo and Miscellaneous Vessels) of this chapter.

their alloys when an electrolyte is present.

(3) A suitable thread compound must be used in making up threaded joints in aluminum pipe to prevent seizing which might cause leakage and perhaps prevent disassembly. Pipe in the annealed temper should not be threaded.

(4) The corrosion resistance of copper bearing aluminum alloys in a marine atmosphere is poor and alloys with copper contents exceeding 0.6 percent should not be used. Refer to Table 56.20-2(a) for further guidance.

(b) The use of cast aluminum alloys in hydraulic fluid power systems is described in § 58.30-15(e) of this subchapter.

§ 56.60-25 Nonmetallic materials.

(a) *Plastic pipe-nonvital service.* Plastic pipe may be used for nonvital fresh and salt water service, subject to the following limitations:

(1) Penetrations of required watertight decks and bulkheads by any plastic pipe systems are prohibited, except when:

(i) Each such penetration is accomplished using an acceptable metallic spool piece, welded or otherwise attached to the bulkhead or deck by an accepted method; and

(ii) An acceptable metallic shutoff valve in installed adjacent to the spool piece. This valve shall be operable from above the bulkhead deck. If two valves are installed, one on either side of the bulkhead, the valves need not be operable from above the bulkhead deck provided immediate access to both is possible. Where both plastic and metallic pipes are used in a bulkhead penetrating system and where the two materials exist entirely on opposite sides of the bulkhead, the required shutoff valve shall be installed at the bulkhead in the metallic part of the system, and may be locally operated provided immediate access is possible.

(2) Penetrations of Classes "A" and "B" fire control bulkheads and decks by plastic pipe are prohibited without special precautions being taken to insure that the fire integrity of the divisions are not compromised. Methods of penetration shall be detailed on plan submission.

(3) The use of plastic pipe within concealed spaces in the accommodation and service areas is not permitted unless such piping is within ducts or trunks completely surrounded by "A" class divisions.

(4) Classes "A" and "B" divisions are defined in Subpart 32.57 of Subchapter D (Tank Vessels), Subpart 72.05 of Subchapter H (Passenger Vessels), and Subpart 92.07 of Subchapter I (Cargo and Miscellaneous Vessels) of this chapter. Concealed spaces are areas behind ceilings or linings or between double bulkheads.

(5) Plastic pipe may not be used outboard of the required metallic valve in any piping system penetrating the vessel's shell. (See § 56.50-95(f). Where this shell valve and the plastic pipe are in the same unmanned space, the valve shall be operable from above the freeboard deck.

(6) The maximum pressure and temperature of the system shall not exceed 150 pounds per square inch and 140° F., respectively; or as may be specifically authorized by the Commandant.

(7) Materials used in the fabrication of plastic pipe shall be unplasticized rigid polyvinylchloride (PVC) conforming to the following requirements:

(i) The material specifications covering materials fabricated of rigid polyvinylchloride (PVC), shall comply with the following standard specifications issued by the American Society of Testing Materials, subject to the limitations noted in this subpart:

(*a*) *Pipe (PCV).*

ASTM D1785 (Schedule 40, 80, 120).
ASTM D2241 (Standard Dimension Ratio).
Type I Grade 1 or 2.
Type II Grade 1.
Type IV Grade 1.

(*b*) *Fittings (PVC).*

ASTM D2464 (Schedule 80 threaded).
ASTM D2466 (Schedule 40 socket).
ASTM D2467 (Schedule 80 socket).
Type I Grade 1 or 2.
Type II Grade 1.

(ii) PVC pipe that is to be used for potable water shall bear the seal of approval or NSF mark of the National Sanitation Foundation Testing Laboratory, Incorporated, School of Public Health, University of Michigan, Ann Arbor, Mich. 48103.

(8) In using PVC pipe, a schedule (for D1785) or Standard Dimension Ratio (for D2241) shall be chosen so that the maximum value of hoop stress in service shall not be more than 20 percent of the specified minimum burst strength as listed in the applicable specification.

(9) Pipe joints shall be of the slip sleeve, socket, or screwed type. Screwed joints may be used only on D1785 pipe having at least Schedule 80 wall thickness, or Class T, D2241 pipe.

(10) Materials such as glass reinforced resins, or other plastics may be authorized by the Commandant if full physical and chemical description is furnished. Flammability of the product shall not exceed the burning rate of the self-extinguishing type as determined by the standard test method ASTM D635.

(b) *Plastic pipe-vital service.* Plastic pipe may be used for vital fresh and salt water service, subject to the limitations for nonvital service in paragraph (a) of this section, and the following:

(1) Vital machine survey by plastic pipe must be duplicated by equivalent machinery units served entirely by conventional metallic pipe, however when such machines are in separate watertight compartments, or they are located or insulated such that damage to both by a single localized fire is unlikely, both may be fitted with plastic pipe. The Marine inspector shall make the final determination as to the adequacy of the separation between duplicate machinery units installed in the same watertight compartment. In the latter two cases, failure of one plastic pipe system shall not affect the operation of the other. As an equivalent in cases where only a single machinery unit is installed, parallel, but independent, piping systems, one of plastic and the other of metallic materials, is acceptable. In installations where metallic piping is required to duplicate or parallel plastic piping, failure of the plastic pipe shall in no way interfere with the proper operation of the metallic pipe or the machinery it serves.

(c) *Nonmetallic flexible hose.* (1) The installation requirements for nonmetallic flexible hose shall be as specified in Table 56.60–25(c).

TABLE 56.60–25(c)—INSTALLATION REQUIREMENTS FOR NONMETALLIC FLEXIBLE HOSE

Type of service	Maximum service pressure (p.s.i.)	Type cover required	Required hose reinforcement	Where permitted
Vital fresh and salt water	150	Self-extinguishing [1]	Wire or polyester	(2, 3).
Nonvital fresh and salt water	150	do [1]	do	(4).
Nonvital water and pneumatic	50	do [1]	None	(4)
Do	150	do(1)	Fiber	(4).
Lube oil and fuel systems		do [1, 5]	Wire	For flexibility only.(6)
Fluid power systems		do [1]	Wire or polyester	(7).

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[1] The hose cover shall be judged self-extinguishing by test method ASTM D 1692.

[2] May be used in duplicate installations in accordance with § 56.60–25(b) for plastic pipe or in reasonable lengths where flexibility is required at pressures not exceeding manufacturer's rating subject to the limitations of § 56.60–25(a) (1) through (6) for plastic pipe.

[3] Casualty control systems, such as firefighting and bilge systems, may utilize a flexible connection only if the pump is flexibly supported and the flexible connection is located directly at the pump.

[4] May be used subject to the limitations of § 56.60–25(a) (1) through (6) for plastic pipe.

[5] The hose assembly shall be capable of withstanding free burning gasoline for 2½ minutes (test details available from the Coast Guard (MMT)).

[6] May only be used in reasonable lengths for the purpose of flexibility at pressures not exceeding manufacturer's rating.

[7] See § 58.30–20 of this subchapter for installations permitted.

(2) Wire reinforced nonmetallic flexible hose shall be fabricated with an inner tube and a cover of synethetic rubber or other suitable material reinforced with wire or polyester braid.

(3) The innertube for nonmetallic flexible hose shall be of seamless construction, uniform gage and shall be

compatible with the substances carried therein.

(4) Flexible hose assemblies shall be designed for a bursting pressure of not less than 4 times the maximum working pressure of system in which it is to be installed.

(5) Hose shall be complete with factory-assembled and fittings requiring no further adjustment of the fittings on the hose, except that reusable type fittings may be used provided they are of a type whose design is approved by the Commandant. A hydrostatic test of hose assemblies shall be conducted in accordance with Subpart 56.97.

(6) Nonmetallic flexible hose shall be marked with the manufacturer's name or trademark, type or catalog number and maximum allowable working pressure.

(d) Plastic valves, fittings, and flanges may be used in systems employing plastic pipe. Such valves, fittings, and flanges shall be designed, fabricated, tested, and installed so as to satisfy the intent of the requirements for plastic pipe contained in this section.

(e) Short nonmetallic expansion joints may be used in vital and nonvital machinery sea connections inboard of the skin valve. Such joints shall be reinforced with wire braid, polyester or fibrous materials. The cover materials shall be judged self-extinguishing by test method ASTM D1692. Design shall provide a burst pressure of not less than four times the maximum allowable working (rated) pressure. These joints shall not be used to correct for improper piping workmanship or misalignment. Joint movements may not exceed the limits set by the joint manufacturer. Refer also to § 56.35-10.

(f) If it is desired to use nonmetallic materials other than those specified in this section, a request furnishing the chemical and physical properties of the material shall be submitted to the Commandant for consideration.

(5 U.S.C. 552; 14 U.S.C. 633)

[CGFR 68-82, 33 FR 18843, Dec. 18, 1968, as amended by CGFR 69-127, 35 FR 9979, June 17, 1970; CGD 72-104R, 37 FR 14234, July 18, 1972; CGD 72-206R, 38 FR 17229, June 29, 1973; CGD 73-254, 40 FR 40165, Sept. 2, 1975; CGD 78-108, 43 FR 46545, Oct. 10, 1978]

Subpart 56.65—Fabrication, Assembly and Erection

§ 56.65-1 General (replaces 127 through 135.4).

(a) The requirements for fabrication, assembly and erection in Subparts 56.70 through 56.90 shall apply in lieu of 127 through 135.4 of ANSI-B31.1. Those paragraphs reproduced are so noted.

[CGFR 68-82, 33 FR 18843, Dec. 18, 1968, as amended by CGFR 69-127, 35 FR 9978, June 17, 1970]

Subpart 56.70—Welding

§ 56.70-1 General.

(a) The following applies essentially to the welding of ferrous materials. The welding of aluminum, copper, etc., requires different preparations and procedures, and should be referred to the Commandant.

§ 56.70-3 Limitations.

Backing rings. Backing strips used at longitudinal welded joints must be removed.

[CGD 73-254, 40 FR 40165, Sept. 2, 1975]

§ 56.70-5 Material.

(a) *Filler metal.* All filler metal, including consummable insert material, must comply with the requirements of section IX, ASME Boiler and Pressure Vessel Code and § 57.02-4 of this subchapter.

(b) *Backing rings.* When metallic backing rings are used they shall be made from material of weldable quality compatible with the base metal, whether subsequently removed or not. When nonmetallic backing rings are used they shall be of material which does not deleteriously affect either base or weld metal, and shall be removed after welding is completed. Backing rings may be of the consumable insert type, removable ceramic type, of solid or split band type. A ferrous backing ring which becomes a permanent part of the weld shall not exceed 0.05 percent sulphur. If two abutting surfaces are to be welded to a third member used as a backing ring and one or two of the three members are ferritic and the other member or members are austenitic, the satisfactory use of such materials shall be determined by procedure qualifications.

[CGFR 68-82, 33 FR 18843, Dec. 18, 1968, as amended by CGD 73-254, 40 FR 40165, Sept. 2, 1975]

§ 56.70-10 Preparation (reproduces 127.3).

(a) *Butt welds (reproduces 127.3.1)*—(1) *End preparation.* (i) Oxygen or arc cutting is acceptable only if the cut is reasonably smooth and true, and all slag is cleaned from the flame cut surfaces. Discoloration which may remain on the flame cut surface is not considered to be detrimental oxidation.

(ii) Butt-welding end preparation dimensions contained in ANSI-B16.25 or any other end preparation which meets the procedure qualification requirements are acceptable.

(iii) If piping component ends are bored, such boring shall not result in the finished wall thickness after welding being less than the minimum design thickness. Where necessary, weld metal of the appropriate analysis may be deposited on the inside or outside of the piping component to provide sufficient material for machining to insure satisfactory fitting of rings.

(iv) If the piping component ends are upset they may be bored to allow for a completely recessed backing ring, provided the remaining net thickness of the finished ends is not less than the minimum design thickness.

(2) *Cleaning.* Surfaces for welding shall be clean and shall be free from paint, oil, rust, scale, or other material which is detrimental to welding.

(3) *Alignment.* The inside diameters of piping components to be joined must be aligned as accurately as practicable within existing commercial tolerances on diameters, wall thicknesses, and out of roundness. Alignment must be preserved during welding. Where ends are to be joined and the internal misalignment exceeds $\frac{1}{16}$-inch, it is preferred that the component with the wall extending internally be internally trimmed (see Fig. 127.3.1) so that adjoining internal surfaces are approximately flush. However, this trimming must not reduce a piping component wall thickness below the minimum design thickness and the change in the contour may not exceed 30°.

(4) *Spacing.* The root opening of the joint shall be as given in the procedure specification.

(b) *Fillet welds (reproduces 127.3.2).* In making fillet welds, the weld metal must be deposited in such a way as to obtain adequate penetration into the base metal at the root of the weld. Piping components which are to be joined in a manner which includes fillet welding shall be prepared in accordance with applicable provisions and requirements of § 56.70-10. For typical details see Figures 127.4.4 A, B, and C of ANSI-B31.1.

[CGFR 68-82, 33 FR 18843, Dec. 18, 1968, as amended by CGFR 69-127, 35 FR 9978, June 17, 1970; CGD 73-254, 40 FR 40165, Sept. 2, 1975]

§ 56.70-15 Procedure.

(a) *General.* (1) Qualification of the welding procedures to be used, and of the performance of welders and operators, is required, and shall comply with the requirements of Part 57 of this subchapter.

(2) No welding shall be done if there is direct impingement of rain, snow, sleet, or high wind on the piping component weldment.

(3) Sections of pipe shall be welded insofar as possible in the fabricating shop. Prior to welding Class I piping, low temperature piping, or nuclear piping the fabricator shall request a marine inspector to visit his plant to examine his fabricating equipment and to witness the qualification tests required by Part 57 of this subchapter. One test specimen shall be prepared for each process and welding position to be employed in the fabrication.

(b) *Girth butt welds.* (1) (Reproduces 127.4.2(a)). Girth butt welds must be complete penetration welds and may be made with a single vee, double vee, or other suitable type of groove, with or without backing rings or consummable inserts."

(2) Girth butt welds in Classes I, I-L, and II-L piping systems shall be double welded butt joints or equiva-

lent single welded butt joints for pipe diameters exceeding three-fourth inch nominal pipe size. The use of a single welded butt joint employing a backing ring (note restrictions in paragraph (b)(2)(iv) of this section) on the inside of the pipe is an acceptable equivalent for Class I and Class II-L applications, but not permitted for Class I-L applications. Single welded butt joints employing either an inert gas for first pass backup or a consumable insert ring may be considered the equivalent of a double welded butt joint for all classes of piping and is preferable for Classes I-L and II-L systems where double butt welds cannot be used. Appropriate welding procedure qualification tests shall be conducted as specified in Part 57 of this subchapter. A first pass inert gas backup is intended to mean that the inside of the pipe is purged with inert gas and that the root is welded with the inert gas metal arc (mig) or inert gas tungsten arc (tig) processes. Classes I, I-L, and II-L piping are required to have the inside of the pipe machined for good fit up if the misalignment exceeds that specified in § 56.70-10(a)(3). In the case of Class II piping the machining of the inside of the pipe may be omitted. For single welded joints, where possible, the inside of the joint shall be examined visually to assure full penetration. Radiographic examination of at least 20 percent of single welded joints to check for penetration is required for all Class I and Class I-L systems regardless of size following the requirements of Table 56.95-10. Ultrasonic testing may be utilized in lieu of radiographic examination if the procedures are approved.

(3) For Class II piping, the type of joints shall be similar to Class I piping, with the following exceptions:

(i) Single-welded butt joints may be employed without the use of backing rings in all sizes provided that the weld is chipped or ground flush on the root side of the weld.

(ii) For services such as vents, overflows, and gravity drains, the backing ring may be eliminated and the root of the weld need not be ground.

(iii) Square-groove welds without edge preparation may be employed for butt joints in vents, overflows, and gravity drains where the pipe wall thickness does not exceed three-sixteenth inch.

(iv) The crimped or forged backing ring with continuous projection around the outside of the ring is acceptable only for Class II piping. The projection must be completely fused.

(4) Tack welds which become part of the finished weld, shall be made by a qualified welder. Tack welds made by an unqualified welder shall be removed. Tack welds which are not removed shall be made with an electrode which is the same as or equivalent to the electrode to be used for the first pass. Their stopping and starting ends must be properly prepared by grinding or other suitable means so that they may be satisfactorily incorporated into the final weld. Tack welds which have cracked shall be removed.

(5) (Reproduce 127.4(c)). When components of different outside diameters are welded together, the weld joint must be filled to the outside surface of the component having the larger diameter. There must be a gradual transition, not exceeding a slope of 1:3, in the weld between the two surfaces. To avoid unnecessary weld deposit, the outside surface of the component having the larger diameter must be tapered at an angle not to exceed thirty degrees with the axis of the pipe. (See Fig. 127.4.2.).

(6) (Modifies 127.4.2(d)). As-welded surfaces are permitted, however, the surface of welds must be sufficiently free from coarse ripple, grooves, overlaps, abrupt ridges and valleys to meet the following:

(i) The surface condition of the finished welds must be suitable for the proper interpretation of radiographic and other nondestructive examinations when nondestructive examinations are required by § 56.95-10. In those cases where there is a question regarding the surface condition on the interpretation of a radiographic film, the film must be compared to the actual weld surface for interpretation and determination of acceptability.

(ii) Reinforcements are permitted in accordance with Table 56.70-15.

(iii) Undercuts must not exceed $\frac{1}{32}$-inch and must not encroach on the minimum required section thickness.

(iv) If the surface of the weld requires grinding to meet the above criteria, care must be taken to avoid reducing the weld or base material below the minimum required thickness.

(7) The type and extent of examination required for girth butt welds is specified in Table 56.95-10.

(8) Sections of welds that are shown by radiography or other examination to have any of the following type of imperfections shall be judged unacceptable and shall be repaired as provided in paragraph (f) of this section:

(i) Any type of crack or zone of incomplete fusion or penetration.

(ii) Any slag inclusion or porosity greater in extent than those specified as acceptable set forth in PW-51 of section I of the ASME Code.

(iii) Undercuts in the external surfaces of butt welds which are more than 1/32-inch deep.

(iv) Concavity on the root side of full penetration girth butt welds where the resulting weld thickness is less than the minimum pipe wall thickness required by this subchapter. Weld reinforcement up to a maximum of 1/32-inch thickness may be considered as pipe wall thickness in such cases.

(c) *Longitudinal butt welds.* Longitudinal butt welds in piping components not made in accordance with the standards and specifications listed in Table 126.1 of ANSI-B31.1 and § 56.60-1(a) and (b) must meet the requirements of paragraph 104.7 of ANSI-B31.1 and may be examined nondestructively by an acceptable method. Imperfections shall not exceed the limits established for girth butt welds except that no undercutting shall be permitted in longitudinal butt welds. See also § 56.60-2(b).

(d) *Fillet welds.* (1) Fillet welds may vary from convex to concave. The size of a fillet weld is determined as shown in Figure 127.4.4A in ANSI-B31.1. Typical minimum fillet weld details for slip-on flanges and socket-welding components are shown in Figure 127.4.4B and Figure 127.4.4C of ANSI-B31.1. (See paragraph (d)(3) of this section on fillet size.)

(2) The limitations on cracks and undercutting set forth in paragraph (b)(8) of this section for girth welds are also applicable to fillet welds.

(3) Class I piping of nominal diameters not exceeding 3 inches and not subject to full radiography by Table 56.95-10 may be joined by sleeves fitted over pipe ends, or by socket type joints. Where full radiography is required only butt type joints may be used. The inside diameter of the sleeve shall not exceed the outside diameter of the pipe or tube by more than 0.080 inch. Fit between socket and pipe shall conform to applicable standards for socket weld fittings. Depth of insertion of pipe or tube within the socket or sleeve shall not be less than three-eighths inch. The fillet weld shall have a throat dimension (see paragraph (d)(1) of this section) of not less than the nominal thickness of the pipe or tube and shall be deposited in a minimum of two passes unless specifically approved otherwise in a special procedure qualification. Requirements for joints employing socket weld and slip-on flanges are covered in § 56.30-10.

(4) Sleeve and socket type joints may be used in Class II piping systems without restriction as to size of pipe or tubing joined. Applicable standards shall be followed on fit. The fillet welds utilized shall have a throat dimension (see paragraph (d)(1) of this section) of not less than the nominal thickness of the pipe or tube and shall be deposited in a minimum of two passes unless specifically approved otherwise in a special procedure qualification. Requirements for joints employing socket weld and slip-on flanges are covered in § 56.30-10.

(e) *Seal welds (reproduces 127.4.5).* (1) Where seal welding of threaded joints is performed, threads shall be entirely covered by the seal weld. Seal welding shall be done by qualified welders.

(2) The limitation on cracks and undercutting set forth in § 56.70-15(b)(8) for girth welds are also applicable to seal welds.

(f) *Weld defect repairs (reproduces 127.4.11).* (1) All defects in welds requiring repair must be removed by a flame or arc-gouging, grinding, chipping, or machining. Repair welds must be made in accordance with the same procedures used for original welds, or by another welding process if it is a part of a qualified procedure, recognizing that the cavity to be repaired may differ in contour and dimensions from the original joint. The types, extent, and method of examination and limits of imperfections of repair welds shall be the same as for the original weld.

(2) Preheating may be required for flame-gouging or arc-gouging certain alloy materials of the air hardening type in order to prevent surface checking or cracking adjacent to the flame or arc-gouged surface.

(g) *Welded branch connections (reproduces 127.4.8).* (1) Figure 127.4.8A, Figure 127.4.8B, and Figure 127.4.8C of ANSI-B31.1 show typical details of branch connections with and without added reinforcement. However, no attempt has been made to show all acceptable types of construction and the fact that a certain type of construction is illustrated does not indicate that it is recommended over other types not illustrated. See also Figure 56.70-15(g) for additional pipe connections.

(2) Figure 127.4.8D of ANSI-B31.1 shows basic types of weld attachments used in the fabrication of branch connections. The location and minimum size of these attachment welds shall conform to the requirements of this paragraph. Weld sizes shall be calculated in accordance with 104.3.1 of ANSI-B31.1, but shall not be less than the sizes shown in Figure 127.4.8D and F of ANSI-B31.1.

(3) The notations and symbols used in this paragraph and in Figure 127.4.8D and F of ANSI-B31.1 are as follows:

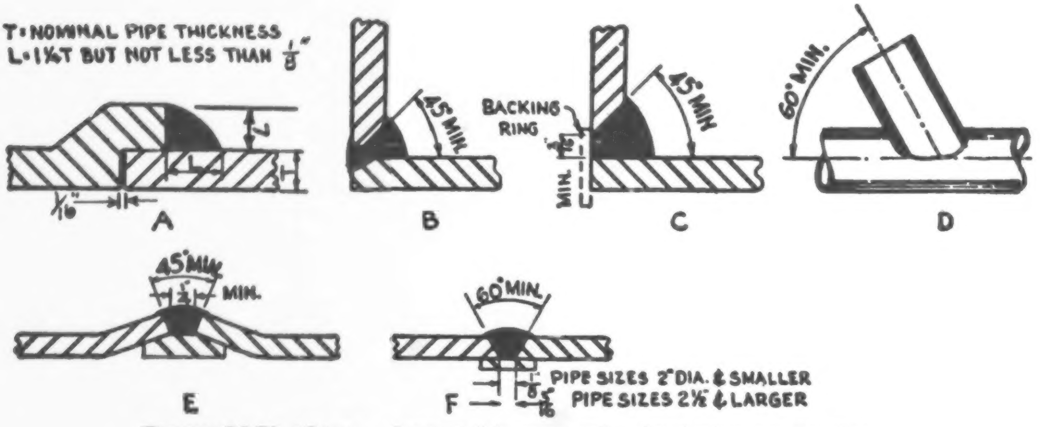

Figure 56.70–15(g).—Acceptable types of welded pipe connections.

t_n = nominal thickness of branch wall less corrosion allowance, inches.
t_c = the smaller of ¼ inch or $0.7t_n$.
t_e = nominal thickness of reinforcing element (ring or saddle), inches ($t_e = 0$ if there is no added reinforcement).
t_{min} = the smaller of t_n or t_e.
t_w = dimension of partial penetration weld, inches.

(4) Branch connections (including specially made integrally reinforced branch connection fittings) which abut the outside surface of the run wall, or which are inserted through an opening cut in the run wall, shall have opening and branch contour to provide a good fit and shall be attached by means of full penetration groove welds except as otherwise permitted in paragraph 56.70(g)(7) of this section. The full penetration groove welds shall be finished with cover fillet welds having a minimum throat dimension not less than t_c. The limitation as to imperfection of these groove welds shall be as set forth in 127.4.2(e) of ANSI-B31.1 for girth welds.

(5) In branch connections having reinforcement pads or saddles, the reinforcement shall be attached by welds at the outer edge and at the branch periphery as follows:

(i) If the weld joining the added reinforcement to the branch is a full penetration groove weld, it shall be finished with a cover fillet weld having a minimum throat dimension not less than t_c the weld at the outer edge, joining the added reinforcement to the run, shall be a fillet weld with a minimum throat dimension of 0.5 t_e.

(ii) If the weld joining the added reinforcement to the branch is a fillet weld, the throat dimension shall not be less than 0.7 t_{min}. The weld at the outer edge joining the outer reinforcement to the run shall also be a fillet weld with a minimum throat dimension of 0.5 t_e.

(6) When rings or saddles are used, a vent hole shall be provided (at the side and not at the crotch) in the ring or saddle to reveal leakage in the weld between branch and main run and to provide venting during welding and heat treating operations. Rings or saddles may be made in more than one piece if the joints between the pieces have strength equivalent to ring or saddle parent metal and if each piece is provided with a vent hole. A good fit shall be provided between reinforcing rings or saddles and the parts to which they are attached.

(7) Branch connections 2 in. NPS and smaller that do not require reinforcement may be constructed as shown in Fig. 127.4.8F of ANSI-B31.1. This construction is limited to use in Class I and II piping systems at a maximum design temperature of 750° F. or a maximum pressure of 1025 psi.

(h) *Heat treatment.* Heat treatment for welds shall be in accordance with Subpart 56.85.

TABLE 56.70-15.—REINFORCEMENT OF GIRTH AND LONGITUDINAL BUTT WELDS

Thickness of base metal (inches)	Maximum thickness of reinforcement for design temperature (inches) below 0° F. or above—		
	750° F.	350°-750° F.	0° F. and above but less than 350° F
Up to ⅛, inclusive	1/16	3/32	3/16
Over ⅛ to 3/16, inclusive	1/16	⅛	3/16
Over 3/16 to ½, inclusive	1/16	5/32	3/16
Over ½ to 1, inclusive	3/32	3/16	3/16
Over 1 to 2, inclusive	⅛	¼	¼
Over 2	5/32	([1])	([1])

[1] The greater of ¼ in. or ⅛ times the width of the weld in inches.

NOTES: 1. For double welded butt joints, this limitation on reinforcement given above applies separately to both inside and outside surfaces of the joint.

2. For single welded butt joints, the reinforcement limits given above apply to the outside surface of the joint only.

3. The thickness of weld reinforcement is based on the thickness of the thinner of the materials being joined.

4. The weld reinforcement thicknesses must be determined for the higher of the abutting surfaces involved.

5. For boiler external piping use the column titled "Below 0° F. or above 750° F." for weld reinforcement thicknesses.

[CGFR 68-82, 33 FR 18843, Dec. 18, 1968, as amended by CGFR 69-127, 35 FR 9978, June 17, 1970; CGD 73-254, 40 FR 40165, Sept. 2, 1975]

§ 56.70-20 Qualification, general.

(a) Qualification of the welding procedures to be used, and of the performance of welders and welding operators, is required, and shall comply with the requirements of the ASME Boiler and Pressure Vessel Code (section IX) except as modified by Part 57 of this subchapter.

(b) Each butt-welded joint of Class I of Class I-L piping shall be marked with the welder's identification symbol. Dies shall not be used to mark the pipe where the pressure exceeds 600 pounds per square inch or the temperature exceeds 750° F. or in Class I-L systems.

Subpart 56.75—Brazing

§ 56.75-5 Filler metal.

(a) The filler metal used in brazing shall be a nonferrous metal or alloy having a melting point above 1,000° F.

and below that of the metal being joined. The filler metal shall meet and flow freely within the desired temperature range and, in conjunction with a suitable flux or controlled atmosphere, shall wet and adhere to the surfaces to be joined.

(b) The brazing material used shall have a shearing strength of at least 10,000 pounds per square inch. The maximum allowable working pressure for brazing piping shall be determined by this part.

(c) (Reproduces 128.1.2.) Fluxes that are fluid and chemically active at the brazing temperature shall be used when necessary to prevent oxidation of the filler metal and the surfaces to be joined and to promote free flowing of the filler metal.

§ 56.75–10 Joint clearance (reproduces 128.2.2).

(a) The clearance between surfaces to be joined shall be no larger than is necessary to insure complete capillary distribution of the filler metal; between 0.002-inch minimum and 0.006-inch maximum.

§ 56.75–15 Heating (reproduces 128.2.3).

(a) The joint shall be brought to brazing temperature in as short a time as possible to minimize oxidation.

§ 56.75–20 Brazing qualification.

(a) The qualification of the brazing procedure, and of the performance of brazers and brazing operators, shall be in accordance with the requirements of part C, section IX of the ASME Code and Part 57 of this subchapter.

(b) Manufacturers shall perform those tests required by paragraph (a) of this section prior to performing production brazing.

§ 56.75–25 Detail requirements.

(a) Pipe may be fabricated by brazing when the temperature to which such connections may be subjected does not exceed 425° F. (For exception refer to § 56.30–30(b)(1).)

(b) (Reproduces 128.2.1.) The surfaces to be brazed shall be clean and free from grease, oxides, paint, scale, and dirt of any kind. Any suitable chemical or mechanical cleaning method may be used to provide a clean wettable surface for brazing.

(c) After the parts to be joined have been thoroughly cleaned the edges to be brazed shall be given an even coating of flux prior to heating the joint as a protection against oxidation.

§ 56.75–30 Pipe joining details.

(a) *Silver brazing.* (1) Circumferential pipe joints may be either of the socket or butt type. When butt joints are employed the edges to be joined shall be cut or machined square and the edges shall be held closely together to insure a satisfactory joint.

(b) *Copper-alloy brazing.* (1) Copper-alloy brazing may be employed to join pipe, valves, and fittings. Circumferential joints may be either of the butt or socket type. Where butt joints are employed, the included angle shall be not less than 90° where the wall thickness is three-sixteenths of an inch or greater. The annular clearance of socket joints shall be held to small clearances which experience indicates is satisfactory for the brazing alloy to be employed, method of heating, and material to be joined. The annular clearance shall be shown on drawings submitted for approval of socket joints.

(2) Copper pipe fabricated with longitudinal joints for pressures not exceeding that permitted by the regulations in this subchapter may have butt, lapped, or scarfed joints. If of the latter type, the kerf of the material shall be not less than 60°.

(c) *Brazing, general.* (1) Heat shall be applied evenly and uniformly to all parts of the joint in order to prevent local overheating.

(2) The members to be joined shall be held firmly in place until the brazing alloy has set so as to prevent any strain on the joint until the brazing alloy has thoroughly solidified. The brazing shall be done by placing the flux and brazing material on one side of the joint and applying heat until the brazing material flows entirely through the lap and shows uniformly along the seam on the other side of the joint. Sufficient flux shall be used to cause the brazing material to appear promptly after reaching the brazing temperature.

Subpart 56.80—Bending and Forming

§ 56.80-5 Bending.

Pipe may be bent by any hot or cold method and to any radius which will result in a bend surface free of cracks, as determined by a method of inspection specified in the design, and substantially free of buckles. Such bends shall meet the design requirements of 102.4.5 and 104.2.1 of ANSI-B31.1. This shall not prohibit the use of bends designed as creased or corrugated. If doubt exists as to the wall thickness being adequate, Class I piping having diameters exceeding 4 inches shall be nondestructively examined by the use of ultrasonics or other acceptable method. Alternatively, the pipe may be drilled, gaged, and fitted with a screwed plug extending outside the pipe covering. The nondestructive method shall be employed where the design temperature exceeds 750° F. Prior to the use of nondestructive method of examination by the above procedure, it shall be demonstrated by the user, in the presence of a marine inspector on specimens similar to those to be examined, that consistent results, having an accuracy of plus or minus 3 percent, can be obtained.

[CGFR 68-82, 33 FR 18843, Dec. 18, 1968, as amended by CGFR 69-127, 35 FR 9979, June 17, 1970]

§ 56.80-10 Forming (reproduces 129.2).

(a) Piping components may be formed (swaging, lapping, or upsetting of pipe ends, extrusion of necks, etc.) by any suitable hot or cold working method, providing such processes result in formed surfaces which are uniform and free of cracks or other defects, as determined by methods of inspection specified in the design.

§ 56.80-15 Heat treatment of bends and formed components.

(a) (Reproduces 129.3.1.) Carbon steel piping which has been heated to at least 1,650° F. for bending or other forming operations shall require no subsequent heat treatment.

(b) Ferritic alloy steel piping which has been heated for bending or other forming operations shall receive a stress relieving treatment, a full anneal, or a normalize and temper treatment, as specified by the design specification before welding.

(c) (Reproduces 129.3.3.) Cold bending and forming of carbon steel having a wall thickness of three-fourths of an inch and heavier, and all ferritic alloy pipe in nominal pipe sizes of 4 inches and larger, or ½-inch wall thickness or heavier, shall require a stress relieving treatment.

(d) (Reproduces 129.3.4.) Cold bending of carbon and ferritic alloy steel pipe in sizes and wall thicknesses less than specified in 129.3.3 of ANSI-B31.1 may be used without a postheat treatment.

(e) (Reproduces 129.3.5.) For other materials the heat treatment of bends and formed components shall be such as to insure pipe properties that are consistent with the original pipe specification.

(f) All scale shall be removed from heat treated pipe prior to installation.

(g) (Reproduces 129.3.6.) Austenitic stainless steel pipe that has been heated for bending or other forming may be used in the "as-bent" condition unless the design specification requires post bending heat treatment.

[CGFR 68-62, 33 FR 18843, Dec. 18, 1968, as amended by CGFR 69-127, 35 FR 9979, June 17, 1970; CGD 73-254, 40 FR 40166, Sept. 2, 1975]

Subpart 56.85—Heat Treatment of Welds

§ 56.85-5 Heating and cooling method (reproduces 131.1).

(a) Heat treatment may be accomplished by a suitable heating method which will provide the desired heating and cooling rates, the required metal temperature, metal temperature uniformity, and temperature control.

§ 56.85-10 Preheating.

(a) The minimum preheat temperatures listed in Table 56.85-10 for P-number materials groupings are mandatory minimum pre-heat temperatures. Preheat is required for Class I, I-L, I-N, II-N and II-L piping when the ambient temperature is below 50° F.

(b) (Modifies 131.2.2.) When welding dissimilar materials the minimum preheat temperature may not be lower than the highest temperature listed in Table 56.85-10 for any of the materials to be welded or the temperature established in the qualified welding procedure.

(c) (Reproduces 131.2.3.) The preheat temperature shall be checked by use of temperature-indicating crayons, thermocouples, pyrometers, or other suitable methods to assure that the required preheat temperature is obtained prior to and uniformly maintained during the welding operation.

TABLE 56.85-10—PREHEAT AND POSTHEAT TREATMENT OF WELDS

ASME Sec IX Nos.	Preheat required			Post heat treatment requirement (1)(2)		
					Time cycle	
	Minimum wall (3)(4) (inch)	Minimum temperature (5)(6)(°F.)	Minimum wall and other (3)(4)(17)(inch)	Temperature (7)(8)(9)(10)(11)(12)(°F.)(inch)	Hour per inch of wall (3)(4)	Minimum time within range (hour)
P-1(16)	All	50 (for .30 C. maximum or less) (13).	Over ¾ in	1,100 to 1,200 (minimum) (maximum).	1	1
P-1(16)	All	175 minimum (for over .30 C.) (13) and wall thickness over 1 in.	......do	......do	1	1
P-3(15)	All walls	175 minimum	Over ½ in	1,200 to 1,350 (minimum) (maximum).	1	1
P-4(15)	Up to ¾ in inclusive.	300 minimum	Over ½ in or over 4 in nom. size or.	1,330 to 1,400 (minimum) (maximum).	1	1
	Over ¾ in	400 minimum	Over .15 C. maximum.			
P-5(15) (less than 5 cr.).	Up to ¾	300 minimum	Over ½ in or over 4 in. nom. size or.	1,300 to 1,425 (minimum) (maximum).	1	1
	Over ¾ in	400	Over 0.15 C. maximum.			
P-5(15) (5 cr. and higher).	Up to ¾ inclusive.	300 minimum	All walls	......do	1	2
	Over ¾ in	400	Over 0.15 C. maximum.			
P-6	All walls	300 minimum (14)..	All walls	1,400 to 1,500 (minimum) (maximum).	1	2
P-8	......do	None required	......do	None required		

For P-7, P-9A, P-9B, P-10C and other materials not listed the Preheat and Postheat Treatment is to be in accordance with the qualified procedure.

Notes Applicable To Table 56.85-10:

(1) Not applicable to dissimilar metal welds.

(2) When postheat treatment by annealing or normalizing is used, the postheat treatment temperatures must be in accordance with the qualified welding procedure.

(3) Wall thickness of a butt weld is defined as the thicker of the two abutting ends after end preparation including I.D. machining.

(4) The thickness of socket, fillet, and seal welds is defined as the throat thicknesses for pressure and nonpressure retaining welds.

(5) Preheat temperatures must be checked by use of temperature indicating crayons, thermocouple pyrometers, or other suitable method.

(6) For inert gas tungsten arc root pass welding lower preheat in accordance with the qualified procedure may be used.

(7) The maximum postheat treatment temperature listed for each P number is a recommended maximum temperature.

(8) Postheat treatment temperatures must be checked by use of thermocouple pyrometers or other suitable means.

(9) Heating rate for furnace, gas, electric resistance, and other surface heating methods must not exceed: (i) 600° F per hour for thicknesses 2 inches and under.

(ii) 600° F per hour divided by ½ the thickness in inches for thickness over 2 inches.

(10) Heating route for induction heating must not exceed:

(i) 600° F per hour for thickness less than 1½ inches (60 and 400 cycles).

(ii) 500° F per hour when using 60 cycles and 400° F per hour when using 400 cycles for thicknesses 1½ inches and over.

(11) When local heating is used, the weld must be allowed to cool slowly from the postheat treatment temperature. A suggested method of retarding cooling is to wrap the weld with asbestos and allow to cool in still air. When furnace cooling is used, the pipe sections must be cooled in the furnace to 1000° F and may then be cooled further in still air.

(12) Local postheat treatment of butt welded joints must be performed on a circumferential band of the pipe. The minimum width of this band, centered on the weld, must be the width of the weld plus 2 inches.

Local postheat treatment of welded branch connections must be performed by heating a circumferential band of the pipe to which the branch is welded. The width of the heated band must extend at least 1 inch beyond the weld joining the branch.

(13) 0.30 C. max applies to specified ladle analysis.

(14) 600°F maximum interpass temperature.

(15) Welding on P-3, P-4, and P-5 with 3 Cr max. may be interrupted only if—

(i) At least ⅜ inch thickness of weld is deposited or 25 percent of welding groove is filled, whichever is greater;

(ii) The weld is allowed to cool slowly to room temperature; and

(iii) The required preheat is resumed before welding is continued.

(16) When attaching welding carbon steel non-pressure parts to steel pressure parts and the throat thickness of the fillet or partial or full penetration weld is ½ in. or less, postheat treatment of the fillet weld is not required for Class I and II piping if preheat to a minimum temperature of 175° F is applied when the thickness of the pressure part exceeds ¾ in.

(17) For Class I-L and II-L piping systems, relief from postweld heat treatment may not be dependent upon wall thickness. See also §§ 56.50-105(a)(3) and 56.50-105(b)(3) of this chapter.

[CGFR 68-82, 33 FR 18843, Dec. 18, 1968, as amended by CGFR 69-127, 35 FR 9980, June 17, 1970; CGD 72-104R, 37 FR 14234, July 18, 1972; CGD 72-206R, 38 FR 17229, June 29, 1973; CGD 73-254, 40 FR 40166, Sept. 2, 1975]

§ 56.85-15 Postheat treatment.

(a) Where pressure retaining components having different thicknesses are welded together as is often the case when making branch connections, the preheat and postheat treatment requirements of Table 56.85-10 apply to the thicker of the components being joined. Postweld heat treatment is required for Classes I, I-L, II-L, and systems. It is not required for Class II piping. Refer to § 56.50-105(a)(3) for exceptions in Classes I-L and II-L systems and to paragraph (b) of this section for Class I systems.

(b) All buttwelded joints in Class I piping shall be postweld heated as required by Table 56.85-10. The following exceptions are permitted:

(1) High pressure salt water piping systems used in tank cleaning operations; and,

(2) Gas supply piping of carbon or carbon molybdenum steel used in gas turbines.

(c) All complicated connections including manifolds shall be stress-relieved in a furnace as a whole as required by Table 56.35-10 before being taken aboard ship for installation.

(d) (Reproduces 131.3.2.) The postheat treatment method selected for parts of an assembly shall not adversely affect other components. Heating a fabricated assembly as a complete unit is usually desirable; however, the size or shape of the unit or the adverse effect of a desired heat treatment on one or more components where dissimilar materials are involved, may dictate alternative procedures such as heating a section of the assembly before the attachment of others, or local circumferential band heating of welded joints in accordance with § 56.85-15(j)(3) and note (12) of Table 56.85-10.

(e) (Reproduces 131.3.3.) Postheat treatment of welded joints between dissimilar metals having different postheat requirements shall be that established in the qualified welding procedure.

(f)-(h) [Reserved]

(i) (Reproduces 131.3.4.) For those materials listed under P-No. 1, when the wall thickness of the thicker of the two abutting ends, after end preparation, is less than three-fourths inch, the weld need not be postheat treated. In all cases, where the nominal wall thickness is ¾ in. or less, postheat treatment is not required.

(j) (1)-(2) [Reserved]

(3) In local postheat treatment the entire band must be brought up to uniform specified temperature over the complete circumference of the pipe section, with a gradual diminishing of the temperature outward from the edges of the band.

[CGFR 68-82, 33 FR 18843, Dec. 18, 1968, as amended by CGD 72-206R, 38 FR 17229, June 29, 1973; CGD 73-254, 40 FR 40167, Sept. 2, 1975]

Subpart 56.90—Assembly

§ 56.90-1 General.

(a) The assembly of the various piping components, whether done in a shop or as field erection, shall be done so that the completely erected piping conforms with the requirements of the regulations in this subchapter and with the specified requirements of the engineering design.

§ 56.90-5 Bolting procedure.

(a) All flanged joints shall be fitted up so that the gasket contact faces bear uniformly on the gasket and then shall be made up with relatively uniform bolt stress. Bolt loading and gasket compression need only be verified by touch and visual observation.

(b) (Reproduces 135.2.2.) In bolting gasketed flanged joints, the gasket shall be properly compressed in accordance with the design principles applicable to the type of gasket used.

(c) Steel to cast iron flanged joints shall be assembled with care to prevent damage to the cast iron flange in accordance with § 56.25-10.

(d) (Reproduces 135.2.4.) All bolts shall be engaged so that there is visible evidence of complete threading through the nut or threaded attachment.

§ 56.90-10 Threaded piping (reproduces 135.4).

(a) Any compound or lubricant used in threaded joints shall be suitable for the service conditions and shall not react unfavorably with either the service fluid or the piping materials.

(b) Threaded joints which are to be seal welded shall be made up without any thread compound.

(c) Backing off to permit alignment of pipe threaded joints shall not be permitted.

Subpart 56.95—Inspection

§ 56.95-1 General (replaces 136).

(a) The provisions in this subpart shall apply to inspection in lieu of 136 of ANSI-B31.1.

(b) Prior to initial operation, a piping installation shall be inspected to the extent necessary to assure compliance with the engineering design, and with the material, fabrication, assembly and test requirements of ANSI-B31.1, as modified by this subchapter. This inspection is the responsibility of the owner and may be performed by employees of the owner or of an engineering organization employed by the owner, together with the marine inspector.

[CGFR 68-82, 33 FR 18843, Dec. 18, 1968, as amended by CGFR 69-127, 35 FR 9979, June 17, 1970]

§ 56.95-5 Rights of access of marine inspectors.

Marine inspectors shall have rights of access to any place where work concerned with the piping is being performed. This includes manufacture, fabrication, assembly, erection, and testing of the piping or system components. Marine inspectors shall have access to review all certifications or records pertaining to the inspection requirements of § 56.95-1, including certified qualifications for welders, welding operators, and welding procedures.

§ 56.95-10 Type and extent of examination required.

(a) *General.* The types and extent of the nondestructive examinations required for the various groups of piping are set forth in Table 56.95-10. In addition a visual examination shall be made.

(b) *Visual examination.* Visual examination consists of observation by the marine inspector of whatever portions of a component or weld are exposed to such observation, either before, during, or after manufacture, fabrication, assembly or test. All welds, pipe and piping components shall be capable of complying with the limitations on imperfections specified in the product specification under which the pipe or component was purchased, or with the limitations on imperfections specified in § 56.70-15(b)(7) and (8), and (c), as applicable.

(c) *Nondestructive types of examinations*—(1) *100 Percent radiography.* Where 100 percent radiography[1] is required for welds in piping, each weld in the piping shall be completely radiographed. If a butt weld is examined by radiography, for either random or 100 percent radiography, the method used shall be as follows:

(i) X-ray or gamma ray method of radiography may be used. The selection of the method shall be dependent upon its adaptability to the work being radiographed. The procedure to be followed shall be as indicated in PW-51 of section I of the ASME Code.

(ii) If a piping component or a weld other than a butt weld is radiographed, the method used shall be in accordance with UW-51 of section VIII of the ASME Code.

(2) *Random radiography.* Where random radiography[1] is required, one or more welds may be completely or partially radiographed. Random radiography is considered to be a desirable means of spot checking welder performance, particularly in field welding where conditions such as position, ambient temperatures, and cleanliness are not as readily controlled as in shop welding. It is to be employed whenever a marine inspector questions a pipe weld not otherwise required to be tested. It is also used as specified in notes (7) and (8) of Table 56.95-10. The standards of acceptance are the same as for 100 percent radiography.

(3) *Ultrasonic.* Where 100 percent ultrasonic testing is specified, the entire surface of the weld being inspected shall be covered using extreme care and careful methods to be sure that a true representation of the actual conditions is obtained. The procedures to be used shall be submitted to the Commandant for approval.

(4) *Liquid penetrant.* Where liquid penetrant examination is required, the entire surface of the weld being examined shall be covered. The examination shall be performed in accordance with appendix VIII to section VIII of the ASME Code. The following standards of acceptance shall be met:

(i) All linear discontinuities and aligned penetrant indications revealed by the test shall be removed. Aligned penetrant indications are those in which the average of the center-to-center distances between any one indication and the two adjacent indications in any straight line is less than three-sixteenths inch. All other discontinuities revealed on the surface need not be removed unless the discontinuities are also revealed by radiography, in which case the pertinent radiographic specification shall apply.

(5) *Magnetic particle.* Where magnetic particle testing is required, the entire surface of the weld being examined shall be covered. The testing shall be performed in accordance with appendix VI to section VIII of the ASME Code. The following standards of acceptance are required for welds. All linear discontinuities and aligned indications revealed by the test shall be removed. Aligned indications are those in which the average of the center-to-center distances between any one indication and the two adjacent indications in any straight line is less than three-sixteenths inch. All other revealed discontinuities need not be removed unless the discontinuities are also revealed by radiography, in which case the requirements of paragraph (c)(1) of this section shall be met.

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[1] Where for some reason, such as joint configuration, radiography is not applicable, another approved examination may be utilized.

TABLE 56.95-10—MANDATORY MINIMUM NONDESTRUCTIVE TESTS FOR WELDS

Class	Material	Nominal-diameter [1]	Wall thickness [1]	Tests [2, 3]			Notes
				RT [4]	MT [5]	PT [6]	
I, I-L, II-L	Any material	<3"	≤⅜"	No	No	No	([7, 9])
I, I-L, II-L	P-1 materials or C-Mo P-3	≥3"	≤⅜"	No [7]	Yes	No	([7, 9])
		<3"	≤⅜"	Yes	No	No	
I, I-L, II-L	Materials other than P-1 or C-Mo P-3.	≥3"	≤⅜"	No [7, 9]	Yes	Yes	([7, 8, 9, 10])
I, I-L, II-L	Any material	≥3"	>⅜"	Yes	No	No	
II	do	≥18"	Any				([11])
		<18"	Any	No	No	No	

[1] The symbol < means less than the dimension stated. The symbol ≤ means equal to or less than the dimension stated. The symbol ≥ means equal to or greater than the dimension stated. The symbol > means greater than the dimension stated.

[2] Fabricators desiring to use ultrasonic testing in lieu of any of the required tests shall submit procedures to the Commandant and obtain approval for its use.

[3] The word "no" means not required. The word "yes" means required.

[4] "RT" means radiographic testing for 100 percent unless otherwise permitted.

[5] "MT" means magnetic particle testing for 100 percent unless otherwise permitted.

[6] "PT" means liquid penetrant testing for 100 percent unless otherwise permitted.

[7] Random radiography of at least 20 percent of joints required for Classes I-L and II-L systems, but ultrasonic testing may be utilized as an alternate inspection method if procedures are approved. Joints examined by radiographic testing or ultrasonic testing need not be tested by magnetic particle testing.

[8] Radiographic testing may be required for certain joining configurations (see § 56.70-15(b)(2)).

[9] When nominal diameter exceeds 4 inches radiographic testing is required regardless of wall thickness. Under such conditions testing by magnetic particle testing or by liquid penetrant testing is not required.

[10] Use liquid penetrant testing for nonmagnetic materials.

[11] Any method of nondestructive testing may be used.

(5 U.S.C. 552; 14 U.S.C. 633)

[CGFR 68-82, 33 FR 18843, Dec. 18, 1968, as amended by CGD 72-206R, 38 FR 17229, June 29, 1973; CGD 78-108, 43 FR 46546, Oct. 10, 1978]

Subpart 56.97—Pressure Tests

§ 56.97-1 General (replaces 137).

(a) *Scope.* The requirements in this subpart apply to pressure tests of piping in lieu of 137 of ANSI-B31.1. Those paragraphs reproduced are so noted.

(b) *Leak tightness.* It is mandatory that the design, fabrication and erection of piping constructed under the regulations in this subchapter demonstrate leak tightness. Except where otherwise permitted in this subpart, this requirement must be met by a hydrostatic leak test prior to initial operations. Where a hydrostatic test is not practicable, a pneumatic test (section 56.97-35) or initial service leak test (section 56.97-38) may be substituted if approved by the Commandant.

(1) At no time during the hydrostatic test may any part of the piping system be subjected to a stress greater than 90 percent of its yield strength (0.2 percent offset) at test temperature.

(2) Pneumatic tests may be used in lieu of the required hydrostatic test (except as permitted in paragraph (b)(3) of this section), only when—

(i) Piping subassemblies or systems are so designed or supported that they cannot be safely filled with water;[1] or

(ii) Piping subassemblies or systems are to be used in services where traces of the testing medium cannot be tolerated and, whenever possible, the piping subassemblies or system have been previously hydrostatically tested to the pressure required in paragraph 56.97-30(e).

(3) A pneumatic test at a pressure not to exceed 25 psig may be applied before a hydrostatic or a pneumatic test as a means of locating major leaks. The preliminary pneumatic test must be carried out in accordance with the requirements of § 56.97-35.

NOTE.—Compressed gas is hazardous when used as a testing medium. It is, therefore, recommended that special precautions for protection of personnel be taken whenever gas under pressure is used as the test medium.

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[1] These tests may be made with the item being tested partially filled with water, if desired.

(4) The hydrostatic test of the piping system, when conducted in accordance with the requirements of this Part, is acceptable as the test for piping subassemblies and may also be used in lieu of any such test required by the material specification for material used in the piping subassembly or system provided the minimum test pressure required for the piping system is met, except where the installation would prevent performing any nondestructive examination required by the material specification to be performed subsequent to the hydrostatic or pneumatic test.

[CGD 73-254, 40 FR 40167, Sept. 2, 1975]

§ 56.97–5 Pressure testing of nonstandard piping system components.

(a) All nonstandard piping system components such as welded valves and fittings, nonstandard fittings, manifolds, scuppers, seacocks, and other appurtenances shall be individually hydrostatically tested to twice the rated pressure stamped thereon.

(b) Items for which an accepted standard appears in Table 56.60–1(b) need not be tested as described in paragraph (a) of this section, but need only meet the test required in the applicable standard.

§ 56.97–25 Preparation for testing (Reproduces 137.3).

(a) *Exposure of joints.* All joints including welds must be left uninsulated and exposed for examination during the test.

(b) *Addition of temporary supports.* Piping systems designed for vapor or gas may be provided with additional temporary supports, if necessary, to support the weight of the test liquid.

(c) *Restraint or isolation of expansion joints.* Expansion joints must be provided with temporary restraint, if required for the additional pressure load under test, or they must be isolated from the test.

(d) *Isolation of equipment not subjected to pressure test.* Equipment that is not to be subjected to the pressure test must be either disconnected from the piping subassembly or system or isolated by a blank flange or similar means. Valves may be used if the valve with its closure is suitable for the proposed test pressure.

(e) *Treatment of flanged joints containing blinds.* Flanged joints at which blinds are inserted to blank off other equipment during the test need not be tested.

(f) *Precautions against test medium expansion.* If a pressure test is to be maintained for a period of time and the test medium in the system is subject to thermal expansion, precautions must be taken to avoid excessive pressure. A small relief valve set to 1⅓ times the test pressure is recommended during the pressure test.

[CGD 73-254, 40 FR 40167, Sept. 2, 1975]

§ 56.97–30 Hydrostatic tests (Reproduces 137.4).

(a) *Provision of air vents at high points.* Vents must be provided at all high points of the piping subassembly or system in the position in which the test is to be conducted to purge air pockets while the component or system is filling.

(b) *Test medium and test temperature.* (1) Water will be used for a hydrostatic leak test unless another medium is approved by the Commandant.

(2) The temperature of the test medium will be that of the available source unless otherwise approved by the Commandant upon review of the metallurgical aspects of the piping materials with respect to its brittle fracture properties.

(c) *Check of test equipment before applying pressure.* The test equipment must be examined before pressure is applied to ensure that it is tight and that all low-pressure filling lines and other items that should not be subjected to the test pressure have been disconnected or isolated by valves or other suitable means.

(d) *Examination for leakage after application of pressure.* Following the application of the hydrostatic test pressure for a minimum of 10 minutes (see § 56.97–30(g)), examination for leakage must be made of all joints, connections and of all regions of high stress, such as regions around openings and thickness-transition sections.

(e) *Minimum required hydrostatic test pressure.* Except as otherwise permitted in § 56.97-30(f) or § 56.97-40, piping systems must be subjected to a hydrostatic test pressure that at every point in the system is not less than 1.5 times the maximum allowable working pressure.

(f) *Maximum permissible hydrostatic test pressure.* (1) When a system is tested hydrostatically, the test pressure must not exceed the maximum test pressure of any component such as vessels, pumps, or valves in the system.

(2) At no time during the hydrostatic test may any part of the piping system be subjected to a stress greater than 90 percent of its yield strength (0.2 percent offset) at test temperature.

(g) *Hydrostatic test pressure holding time.* The hydrostatic test pressure must be maintained for a minimum total time of 10 minutes and for such additional time as may be necessary to conduct the examination for leakage required by § 56.97-30(d).

[CGD 73-254, 40 FR 40167, Sept. 2, 1975]

§ 56.97-35 Pneumatic tests (Replaces 137.5).

(a) *General Requirements.* When a pneumatic test is performed, it must be conducted in accordance with the requirements of this section.

(b) *Test medium and test temperature.* (1) The gas used as the test medium must not be flammable.

(2) The temperature of the test medium will be that of the available source unless otherwise approved by the Commandant upon review of the metallurgical aspects of the piping materials with respect to its brittle fracture properties.

(c) *Check of test equipment before applying pressure.* The test equipment must be examined before pressure is applied to ensure that it is tight and that all items that should not be subjected to the test pressure have been disconnected or isolated by valves or other suitable means.

(d) *Procedure for applying pressure.* The pressure in the system must gradually be increased to not more than one-half of the test pressure, after which the pressure is increased in steps of approximately one-tenth of the test pressure until the required test pressure has been reached.

(e) *Examination for leakage after application of pressure.* Following the application of pressure for the time specified in § 56.97-35(h), examination for leakage in accordance with 56.97-30(d) must be conducted.

(f) *Minimum required pneumatic test pressure.* Except as provided in § 56.97-35(g) or § 56.97-40, the pneumatic test pressure may not be less than 1.20 nor more than 1.25 times the maximum allowable working pressure of the piping subassembly system.

(g) *Maximum permissible pneumatic test pressure.* When a system is tested pneumatically, the test pressure may not exceed the maximum test pressure of any component such as vessels, pumps or valves in the system.

(h) *Pneumatic test pressure holding time.* The pneumatic test pressure must be maintained for a minimum total time of 10 minutes and for such additional time as may be necessary to conduct the examination for leakage required in § 56.97-30(d).

[CGD 73-254, 40 FR 40168, Sept. 2, 1975]

§ 56.97-38 Initial service leak test (Reproduces 137.7).

(a) An initial service leak test and inspection is acceptable when other types of test are not practical or when leak tightness is conveniently demonstrable due to the nature of the service. One example is turbine extraction piping where shut-off valves are not available for isolating a line and where temporary closures are impractical. Others may be systems for service water, low pressure condensate, plant and instrument air, etc., where checking out of pumps and compressors afford ample opportunity for leak tightness inspection prior to fullscale operation.

(b) The piping system must be gradually brought up to design pressure. After inspection of the piping system has proven that the installation is complete and all joints are leaktight, the piping has met the requirements of § 56.97-1.

[CGD 73-254, 40 FR 40168, Sept. 2, 1975]

§ 56.97-40 Installation tests.

(a) The following piping systems shall be hydrostatically leak tested in the presence of a marine inspector at a pressure of 1½ times the maximum allowable working pressure of the system:

(1) Class I steam, feedwater, and blowoff piping. Where piping is attached to boilers by welding without practical means of blanking off for testing, the piping shall be subjected to the same hydrostatic pressure to which the boiler is tested. The maximum allowable working pressures of boiler feedwater and blowoff piping shall be the design pressures specified in §§ 56.50-30(a)(3) and 56.50-40(b), respectively.

(2) Fuel oil discharge piping between the pumps and the burners, but not less than 500 pounds per square inch.

(3) High-pressure piping for tank cleaning operations.

(4) Flammable or corrosive liquids and compressed gas cargo piping, but not less than 150 pounds per square inch.

(5) Any class I, I-L, II-L piping.

(6) Cargo oil piping.

(7) Firemains, but not less than 150 pounds per square inch.

(8) Fuel oil transfer and filling piping.

(9) Class I compressed air piping.

(b) Installation testing requirements for refrigeration, fluid power, and liquefied petroleum gas cooking and heating systems may be found in Part 58 of this subchapter.

(c) Class II piping systems shall be tested under working conditions as specified in the section on initial service leak test, § 56.97-38.

[CGFR 68-82, 33 FR 18843, Dec. 18, 1968, as amended by CGFR 69-127, 35 FR 9980, June 17, 1970; CGD 72-206R, 38 FR 17229, June 29, 1973 CGD 73-254, 40 FR 40168, Sept. 2, 1975]

PART 57—WELDING AND BRAZING

Subpart 57.01—Scope

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57.06-1 Production test plate requirements.
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57.06-5 Production toughness testing.

Authority: (14 U.S.C. 633; 46 U.S.C. 375, 390(b), 391a, 392, 406, 409, 411, 416, 520p, 49 U.S.C. 1655(b)) E.O. 11239 (30 FR 9671); unless otherwise noted.

Source: CGFR 68-82, 33 FR 18872, Dec. 18, 1968, unless otherwise noted.

Subpart 57.01—Scope

§ 57.01-1 Qualifications and production tests.

(a) (Replaces QW 101 and QB 101.) The regulations in this Part shall apply to the qualification of welding procedures, welders, and brazers, and to production tests for all types of manual and machine arc and gas welding and brazing processes.

(b) (Modifies QW 305 and QB 305.) Operators of fully automatic welding and brazing machines are specifically exempt from performance qualification tests.

[CGFR 68-82, 33 FR 18872, Dec. 18, 1968, as amended by CGD 74-102, 40 FR 27460, June 30, 1975]

Subpart 57.02—General Requirements

§ 57.02-1 Adoption of section IX of the ASME Code.

(a) The qualifications for all types of welders and brazers, the qualification of welding procedures, and the production tests for all types of manual and machine arc and gas welding and brazing processes shall be in accordance with section IX of the ASME (American Society of Mechanical Engineers) Code, as limited, modified, or replaced by specific requirements in this part. For general information Table 57.02-1(a) lists the various paragraphs in section IX of the ASME Code which are limited, modified, or replaced by regulations in this Part.

TABLE 57.02-1(a)—LIMITATIONS AND MODIFICATIONS TO THE ADOPTION OF SECTION IX OF THE ASME CODE

Paragraphs in section IX ASME code, and Disposition	Unit of this part
QW-101 replaced by	57.01-1(a).
QW-103 replaced by	57.02-3(a).
QW-201 modified by	57.03-1(a).
QW-202 modified by	57.04-1
QW-202.1 modified by	57.03-1(b).
QW-210 modified by	57.04-1.
QW-211 modified by	57.02-4.
QW-253 modified by	57.03-1(g).
QW-254 modified by	57.03-1(g).
QW-255 modified by	57.03-1(g).
QW-305 modified by	57.01-1(b).
QW-451 modified by	57.03-1(b) and 57.04-1.
QB-101 replaced by	57.01-1(a).
QB-103 replaced by	57.02-3(a).
QB-201 modified by	57.03-1(a).
QB-202 modified by	57.04-1.
QB-305 modified by	57.01-1(b).

(1) As stated in § 50.15-5 of this subchapter, section IX of the ASME Code is adopted and shall be the governing requirements for the qualification of all types of welders and brazers, the qualification of all types of welding procedures, and the production tests for all types of manual and machine arc and gas welding and brazing processes used in fabricating power boilers, nuclear vessels, heating boilers, pressure vessels and piping unless specifically limited, modified or replaced by other regulations in this Part.

(b) References to the ASME Code, like paragraph QW-131.1 indicate:

Q=Section IX, Welding and Brazing Qualifications, ASME Code.
W=Part containing requirements for welding procedure, welder, and welding operator qualifications.
131=Major division within the part.
131.1=Specific subparagraph within the part.

(c) When a paragraph or a section of the regulations in this Part relates to material in section IX of the ASME Code, the relationship with the code will be shown immediately following the heading of the section or at the beginning of the paragraph as follows:

(1) (Modifies Q———.) This indicates that the material in Q——— is generally applicable but is being altered, amplified or augmented.

(2) (Replaces Q———.) This indicates that Q——— does not apply.

(3) (Reproduces Q———.) This indicates that Q——— is being identically reproduced for convenience, not for emphasis.

(Sec. 552, 80 Stat. 383, as amended; 5 U.S.C. 552)

[CGFR 68-82, 33 FR 18872, Dec. 18, 1968, as amended by CGFR 69-127, 35 FR 9980, June 17, 1970; CGD 74-102, 40 FR 27460, June 30, 1975]

§ 57.02-2 Performance qualifications issued by other agencies.

(a) Within the limits of the qualification tests passed, the Officer in Charge, Marine Inspection, may accept welders who have been qualified by other agencies of the Federal Government; by the American Bureau of Shipping; or by the fabricator concerned, provided the fabricator's tests have been certified by an authorized Code inspector as defined in paragraphs PG-91, N-612, HG-515.2, or UG-91 of the ASME Code.

§ 57.02-3 Fabricator's responsibility.

(a) (Replaces QW 103 and QB 103). Each manufacturer or contractor is responsible for the welding and brazing done by his organization and shall conduct tests required in this Part to qualify the welding and brazing procedures used and the performance of welders and brazers who apply these procedures. The manufacturer shall bear the expense of conducting the tests. Each manufacturer shall maintain a record of the test results obtained in welding and brazing procedure and welder and brazer performance qualifications. These required records, together with identification data, shall be maintained by the manufacturer or contractor on the recommended forms illustrated in QW 480 and QB 480 of Section IX, ASME Code, or on any other form acceptable to the Officer in Charge, Marine Inspection. Upon request, duplicate forms shall be furnished by the manufacturer or contractor to the marine inspector.

(b) Except as otherwise provided for in § 57.02-2, the fabricator shall notify the Officer in Charge, Marine Inspection, prior to conducting performance or procedure qualification tests, and arrange a suitable time and place for conducting the tests, so that a marine inspector may be present.

[CGFR 68-82, 33 FR 18872, Dec. 18, 1968, as amended by CGD 74-102, 40 FR 27460, June 30, 1975]

§ 57.02-4 Filler metals.

(a) Except as provided for in paragraph (b) of this section, when filler metal is used in a welded fabrication that is required to meet the requirements of this Part the filler metal must be one that has been approved by the American Bureau of Shipping.

(b) In instances where a fabricator desires to use a filler metal which has not been approved by the American Bureau of Shipping the approval of the filler metal can be made by the Officer in Charge, Marine Inspection on the basis of the fabricator passing the weld procedure qualification tests as outlined in this Part. This alternate means of approval applies to wire-gas and wire-flux combinations as well as to stick electrodes. Filler metal approvals given in this manner will extend only to the specific fabricator to whom they are granted.

[CGD 74-102, 40 FR 27460, June 30, 1975]

Subpart 57.03—Procedure Qualifications

§ 57.03-1 General requirements.

(a) (Modifies QW 201 and QB 201). In order to obtain Coast Guard approval of a weld procedure to be used on welded fabrication that is required to meet the requirements of this Part each manufacturer or contractor must do the following:

(1) Each manufacturer or contractor must submit to the cognizant Officer in Charge, Marine Inspection, for approval, a welding or brazing procedure specification for the particular welding or brazing process to be used. The welding or brazing procedure specification must include a sketch showing joint preparation. Suggested forms showing the information which is required in the welding or brazing procedure specification are in QW 480 and QB 480 of Section IX of the ASME Code.

(2) Each manufacturer or contractor must submit to the cognizant Officer in Charge, Marine Inspection, for approval, the results of the physical tests required by section IX of the ASME Code.

(b) (Modifies QW 202.1 and QW 451). To obtain approval of the welding procedure, fabricators desiring to use any welding process for applications involving temperatures below −18° C (approx. 0° F) must conduct a procedure qualification test in accordance with the requirements of paragraph (a) of this section and the following additional requirements:

(1) The test piece must be large enough so that sufficient material is available for the tests prescribed in QW 451 of the ASME Code, plus toughness tests and a macro-etch specimen.

(2) To obtain approval the fabricator must conduct toughness tests and qualify in accordance with § 54.05 of the subchapter. Results of toughness tests must be submitted for approval

to the cognizant Officer in Charge, Marine Inspection.

(3) The macro-etch specimen must be submitted with the test results required by paragraph (a) of this section. Macro-etch specimens must not be obtained by flame or arc cutting from the test piece. Weld reinforcement must remain in place unless the production welds are to be machined or ground. Backing rings must also be left in place unless they are to be removed in production.

(4) Low temperature procedure qualification thickness ranges are as indicated in Table 57.03-1(b).

TABLE 57.03-1(b).—LOW TEMPERATURE WELD PROCEDURE QUALIFICATION THICKNESS RANGES

Thickness, "t" of test plate or pipe as welded (inches)	Range of thickness of materials qualified by test plate or pipe (inches)	
	Minimum	Maximum
1/16 to ⅜, inclusive	1/16	⅜
Over ⅜ but less than ¾	*⅜	¾
¾ to 3, inclusive	¾	**t

*For thicknesses less than ⅝ inch, the thickness of the test plate or pipe is the minimum thickness qualified.

**Where "t" is the thickest material over ¾ inch to be used in production.

(5) The limits for heat input production, as measured in Joules/inch, must be at or below the maximum heat input applied to the procedure test plate. The word "maximum" must not be interpreted as either nominal or average.

(c) [Reserved]

(d) For quenched and tempered steels, the Commandant may prescribe special testing to assure that the welding procedure produces weldments which are not prone to low energy fracture through the heat affected zone.

(e) Welding procedures that utilize type E 6012, E 6013, E 6014, E 6024, E 7014, or E 7024 electrode will be approved only for the specific type, size, and brand electrode used. If a different type, size, or brand of electrode is used, a new procedure qualification test must be conducted.

(f) Welding or brazing procedure approvals cannot be transferred from one plant to another plant of the same company or from one company to another.

(g) (Modifies QW 253, QW 254, and QW 255). Item QW 402.4 is an essential variable for all procedure specifications.

[CGD 74-102, 40 FR 27461, June 30, 1975]

Subpart 57.04—Procedure Qualification Range

§ 57.04-1 Test specimen requirements and definition of ranges (modifies QW 202, QW 210, QW 451, and QB 202).

The type and number of specimens that must be tested to qualify an automatic, semiautomatic, or manual procedure specification shall be in accordance with QW 202, QW 210, or QB 202 of the ASME Code as applicable, except as supplemented by §§ 57.03-1(b) and 57.03-1(d).

[CGD 74-102, 40 FR 27461, June 30, 1975]

Subpart 57.05—Performance Qualifications

§ 57.05-1 General.

(a) This subpart supplements the various paragraphs in section IX of the Code dealing with Performance Qualifications (see § 57.02-2).

[CGFR 69-127, 35 FR 9980, June 17, 1970]

§ 57.05-2 Transfer of performance qualifications.

(a) The performance qualification records of a welder may be transferred from one plant to another of the same company or from one company to another company provided the following requirements are met:

(1) The transfer is authorized by the cognizant Officer in Charge, Marine Inspection;

(2) A copy of the qualification test records of each welder together with employment records and identification data are transferred by the plant or company which qualified the welder to the new plant or company; and,

(3) The new plant or company accepts the welder as qualified.

§ 57.05-3 Limited space qualifications.

When a welder is to be qualified for welding or torch brazing of piping on board ship in a limited or restricted space, the space restrictions shown in connection with Figure 57.05-3(a) or (b) shall be used when welding and brazing the test joint.

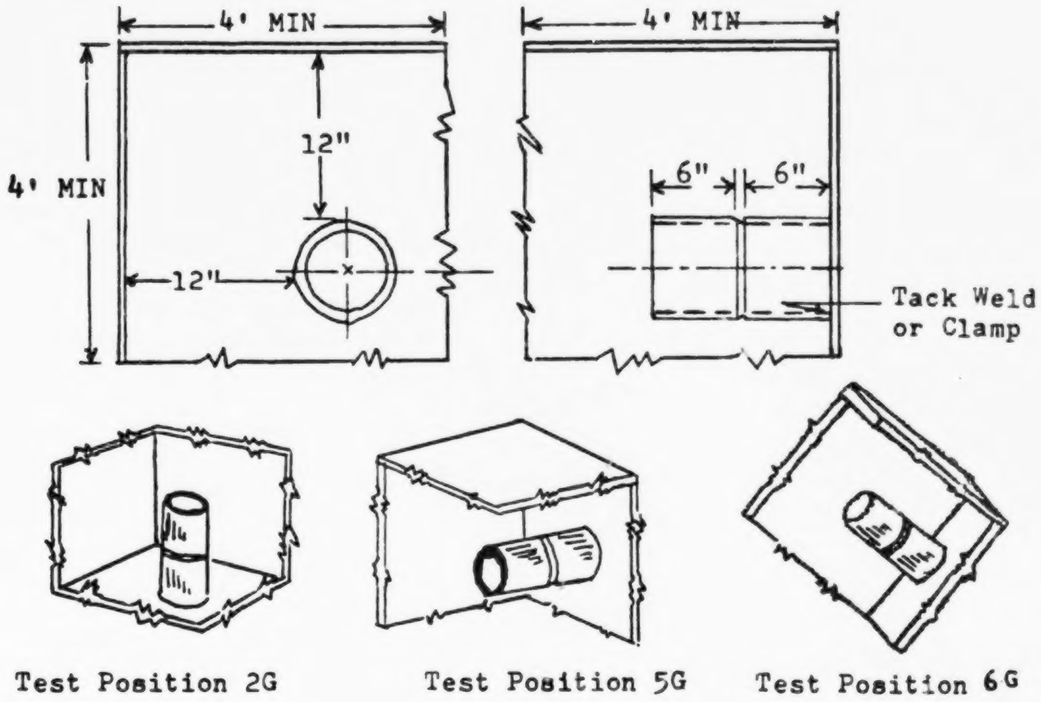

4' MIN
4' MIN
4' MIN
12"
12"
6"
6"
Tack Weld or Clamp
Test Position 2G
Test Position 5G
Test Position 6G

FIGURE 57.05-3(a).—Limited space restriction for pipe welding performance qualification.

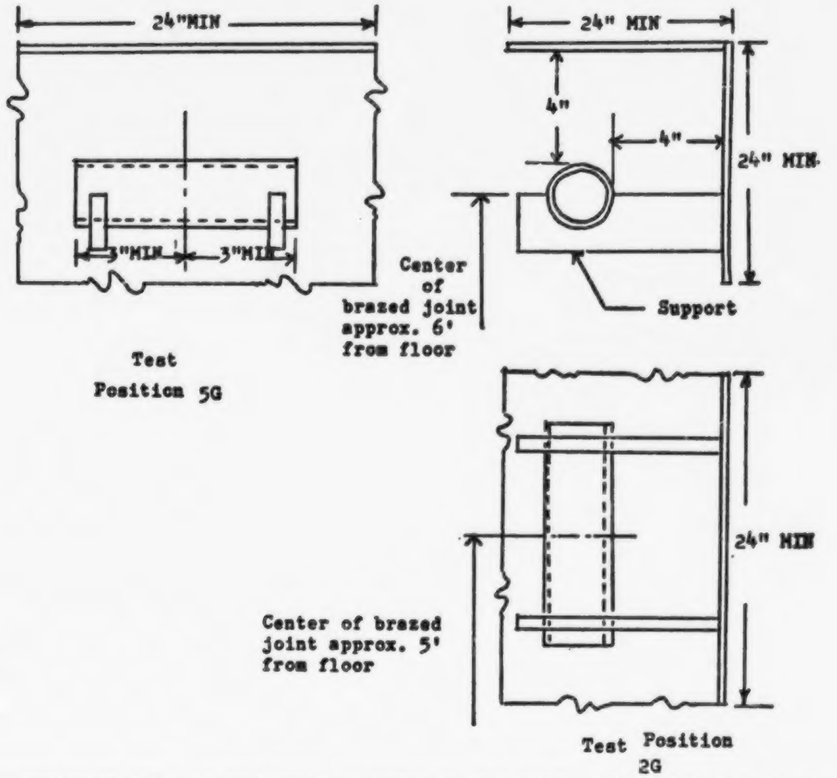

24"MIN
3"MIN
3"MIN
Test Position 5G
24" MIN
4"
4"
24" MIN
Center of brazed joint approx. 6' from floor
Support
24" MIN
Center of brazed joint approx. 5' from floor
Test Position 2G

FIGURE 57.05-3(b).—Limited space restriction for pipe brazing performance qualification.

[CGFR 68-82, 33 FR 118872, Dec. 18, 1968, as amended by CGD 74-102, 40 FR 27461, June 30, 1975]

§ 57.05-4 Welder qualification by procedure tests.

Qualification tests of welders may be omitted for welders who weld satisfactory procedure qualification test assemblies as required by Subpart 57.03.

§ 57.05-5 Low temperature application.

For low temperature application, each welder shall demonstrate his ability to weld satisfactorily in accordance with procedures qualified in accordance with § 57.03-1(b). Manual welding shall be qualified in the position prescribed by the procedure.

Subpart 57.06—Production Tests

§ 57.06-1 Production test plate requirements.

(a) Production test plates shall be provided for Class I, Class I-L, Class II, and Class II-L pressure vessels are specified in this section.

(b) Main power boilers and Class I nuclear vessels shall meet the test plate requirements for Class I pressure vessels. MC nuclear vessels shall meet the test plate requirement for Class II-L pressure vessels, 2 nuclear vessels shall meet the test plate requirements for Class I or Class II pressure vessels, depending on their design pressure and temperature (see § 55.20-5 of this chapter).

(c) Test plates are not required for heating boilers or Class III pressure vessels. Test plates are not required for main power boilers, pressure vessels, or nuclear vessels constructed of P-1, material as listed in QW 422 of the ASME Code whose welded joints are fully radiographed as required in Part 52, 54, or 55 of this subchapter as applicable except when touchness tests are required in accordance with § 57.06-5. When toughness tests are required all prescribed production tests shall be performed.

[CGFR 68-82, 33 FR 18872, Dec. 18, 1968, as amended by CGFR 69-127, 35 FR 9980, June 17, 1970; CGD 72-206R, 38 FR 17229, June 29, 1973; CGD 74-102, 40 FR 27461, June 30, 1975]

§ 57.06–2 Production test plate interval of testing.

(a) At least one set of production test plates shall be welded for each Class I or Class I–L pressure vessel except as follows:

(1) When the extent of welding on a single vessel exceeds 50 lineal feet of either or both longitudinal and circumferential joints, at least one set of test plates shall be welded for each 50 feet of joint.

(2) When the extent of welding on vessels welded in succession exceeds 50 lineal feet of either or both longitudinal and circumferential joints, at least one set of test plates shall be welded for each 50 feet of aggregate joint of the same material where the plate thicknesses fall within a range of one-fourth inch. For each 50-foot increment of weld, test plates shall be prepared at the time of fabrication of the first vessel involving that increment.

(b) Production test plates for Class II–L pressure vessels shall be prepared as for Classes I and I–L vessels except that the provisions of paragraphs (a)(1) and (2) of this section are applicable to each 150 lineal feet of welded joint in lieu of each 50 lineal feet.

(c) In the case of Class II pressure vessels no more than one set of production test plates need be prepared for each 300 lineal feet of either or both longitudinal and circumferential joints. In the case of single vessel fabrication a set of test plates is required for each 300 lineal feet of weld or fraction thereof. In the case of multiple vessel fabrication where each increment of 300 lineal feet of weld involves more than one pressure vessel, the set of test plates shall be prepared at the time of fabrication of the first vessel involving that increment.

§ 57.06–3 Method of performing production testing.

(a) Except as otherwise specified in this section a test plate shall be attached to the shell plate on one end of the longitudinal joint of each vessel as shown in Figure 57.06–3, so that the edges of the test plate to be welded are a continuation of and duplication of the corresponding edges of the longitudinal joint. For attached test plates, the weld metal shall be deposited in the test plate welding groove continuously with the weld metal deposited in the groove of the longitudinal joint. As an alternate method, the marine inspector may permit the use of separate test plates, provided the same welding process, procedure, and technique employed in the fabrication of the longitudinal joint are used in welding the test plates.

(b) All test plates, whether attached to the shell or separate in accordance with paragraphs (a) and (d) of this section, shall be prepared from material of the same specification, thickness, and heat treatment and, for Class I–L and Class II–L vessels, the same heat as that of the vessel for which they are required. However, except when required to be from a specific heat, test plates may be prepared from material of a different product form, such as plate in lieu of a forging, provided the chemical composition is within the vessel material specification limits and the melting practice is the same.

(c) Test plates are not required for welded nozzle attachments.

(d) In the case of vessels having no longitudinal welded joints, at least one set of test plates shall be welded for each vessel, using the circumferential joint process, procedure and technique, except that the provisions of § 57.06–2(a) shall also apply for Classes I and I–L vessels, and that the provisions of § 57.06–2 (a) and (c) shall also apply for Classes II and II–L vessels.

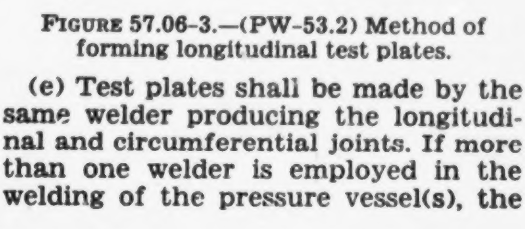

Test Plates
Reinforcing Bars clamped or welded to back of Test Plates.
Drum Shell
Test Plates to be Tack Welded to the Shell or otherwise Supported in position.
Test Plate
Test Plate
Reinforcing Bars
Shell
Double Welded Butt Joint Shall be Used
Shell

FIGURE 57.06–3.—(PW–53.2) Method of forming longitudinal test plates.

(e) Test plates shall be made by the same welder producing the longitudinal and circumferential joints. If more than one welder is employed in the welding of the pressure vessel(s), the test plates shall be made by the welder designated by the marine inspector. The test plates shall be of the same thickness as the material being welded and shall be of sufficient size to provide two specimens of each type required, except that in the case of pressure vessels having no longitudinal seams, the test plate need be only of sufficient length to provide one set of test specimens, and if a retest is necessary, an additional set of test plates may be welded separately.

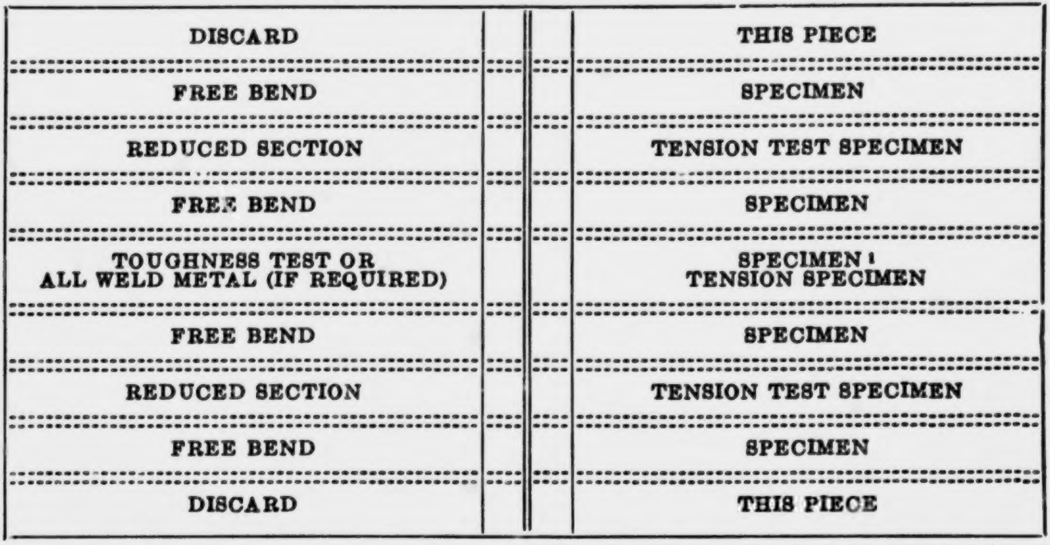
§ 57.06-4 Production testing specimen requirements.

(a) For test plates three-fourths inch or less in thickness one reduced section tensile specimen and two free-bend specimens shall be tested. For plates exceeding three-fourths inch in thickness one reduced section tensile specimen, one free-bend specimen and one guided side bend specimen shall be tested. In addition boiler drums of thickness five-eighths inch or greater shall have a tension test specimen of the weld metal as required by paragraph (f)(2) of this section. Toughness tests are required for Classes I-L and II-L pressure vessels and Classes A and B nuclear vessels as specified in § 57.06-5.

(b) The test plates shall be so supported that the warping due to welding shall not throw the finished test plate out of line by an angle of over 5°.

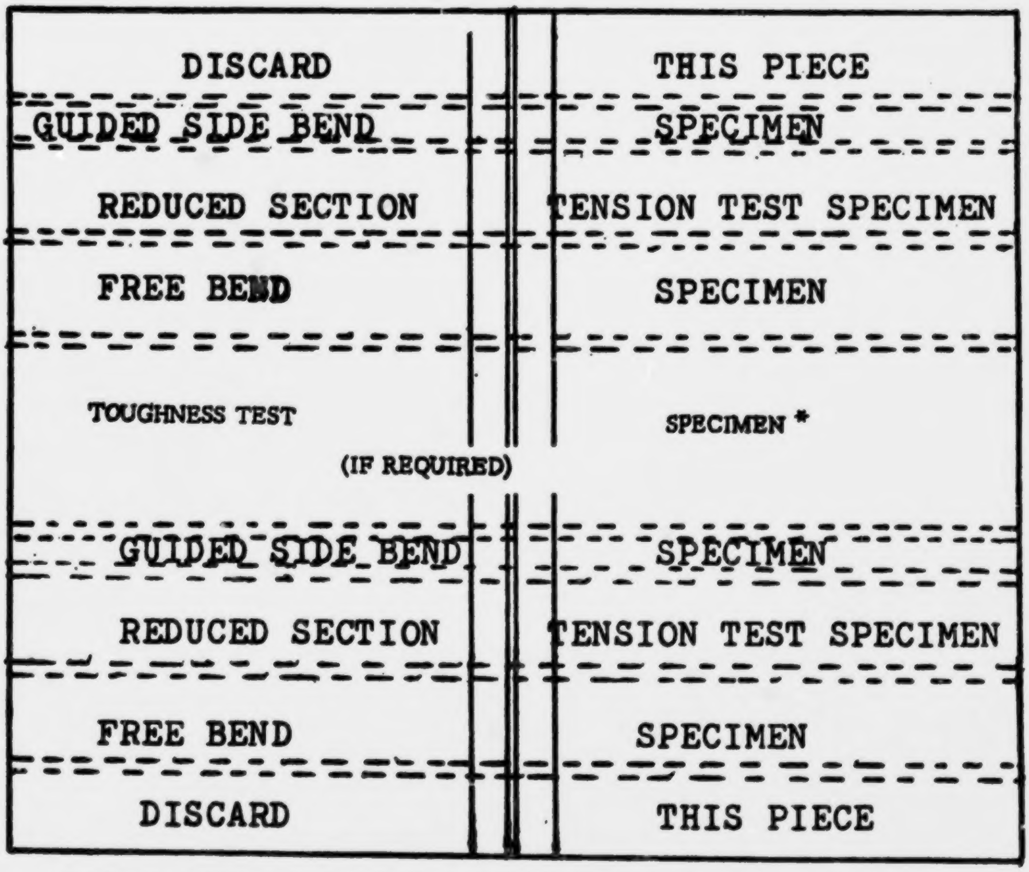
(c) Where the welding has warped the test plates, the plates shall be straightened before being stress-relieved. The test plates shall be subjected to the same stress-relieving operation as required by this subchapter for the pressure vessel itself. At no time shall the test plates be heated to a temperature higher than that used for stress-relieving the vessel.

(d) The bend specimens shall be taken from opposite sides of the reduced-section tensile specimen in their respective test plates as shown in Figures 57.06-4(d)(1) and 57.06-4(d)(2).


DISCARD THIS PIECE
FREE BEND SPECIMEN
REDUCED SECTION TENSION TEST SPECIMEN
FREE BEND SPECIMEN
TOUGHNESS TEST OR SPECIMEN [1]
ALL WELD METAL (IF REQUIRED) TENSION SPECIMEN
FREE BEND SPECIMEN
REDUCED SECTION TENSION TEST SPECIMEN
FREE BEND SPECIMEN
DISCARD THIS PIECE

[1] When charpy V notch impact specimens are required, the test plates shall be no smaller than 2 feet on a side.

FIGURE 57.06-4(d)(1).—Workmanship test plates for material three-fourths inch or less in thickness.


DISCARD
THIS PIECE
GUIDED SIDE BEND
SPECIMEN
REDUCED SECTION
TENSION TEST SPECIMEN
FREE BEND
SPECIMEN
TOUGHNESS TEST
SPECIMEN *
(IF REQUIRED)
GUIDED SIDE BEND
SPECIMEN
REDUCED SECTION
TENSION TEST SPECIMEN
FREE BEND
SPECIMEN
DISCARD
THIS PIECE

*WHEN CHARPY V NOTCH IMPACT SPECIMENS ARE REQUIRED, THE TEST PLATES SHALL BE NO SMALLER THAN TWO FEET ON A SIDE

FIGURE 57.06–4(d)(2).—Workmanship test plates for material three-fourths inch or less in thickness.

(e) In submitting the samples for test the manufacturer shall state the minimum and maximum tensile range of the base metal.

(f) The external appearances of the welds and the amount of weld reinforcement shall conform to the requirements for fabrication, and the maximum reinforcement for the test plates shall not exceed the maximum permitted for construction.

(1) The tension-test specimen of the joint shall be transverse to the welded joint and shall be of the full thickness of the plate after the weld reinforcement has been machined flush. The form and dimensions shall be as shown in Figure 57.06–4(f)(1)(i). When the capacity of the available testing machine does not permit testing a specimen of the full thickness of the welded plate, the specimen may be cut with a thin saw into as many portions of the thickness as necessary, as shown in Figure 57.06–4(f)(1)(ii) each of which shall meet the requirements. The tensile strength of the joint specimen when it breaks in the weld shall not be less than the minimum of the specified tensile range of the plate used. If the specimen breaks in the plate at not less than 95 percent of the minimum specified tensile range of the plate and the weld shows no sign of weakness, the test is considered acceptable.

(2) Boiler drums fabricated of plate of thicknesses of five-eighths inch or greater shall have a tension-test specimen of the weld metal machined to

form as shown in Figure 57.06-4(f)(2) taken entirely from the deposited metal. The all-weld tension test specimen shall have a tensile strength of not less than the minimum of the range of the plate which is welded and shall have a minimum elongation in 2 inches of not less than 20 percent.

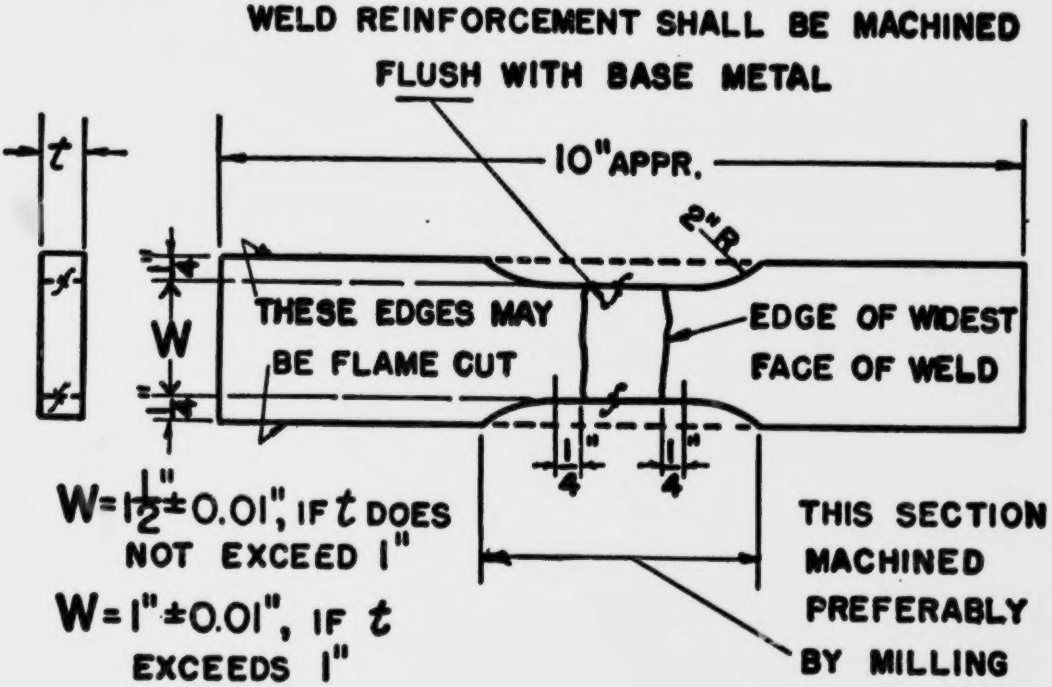

WELD REINFORCEMENT SHALL BE MACHINED FLUSH WITH BASE METAL
t
10" APPR.
2" R
W
THESE EDGES MAY BE FLAME CUT
EDGE OF WIDEST FACE OF WELD
1/4"
1/4"
W = 1 1/2" ± 0.01", IF t DOES NOT EXCEED 1"
W = 1" ± 0.01", IF t EXCEEDS 1"
THIS SECTION MACHINED PREFERABLY BY MILLING

FIGURE 57.06-4(f)(1)(i).—(PW-53.1) Reduced-section test specimen for tension test of welded joint.

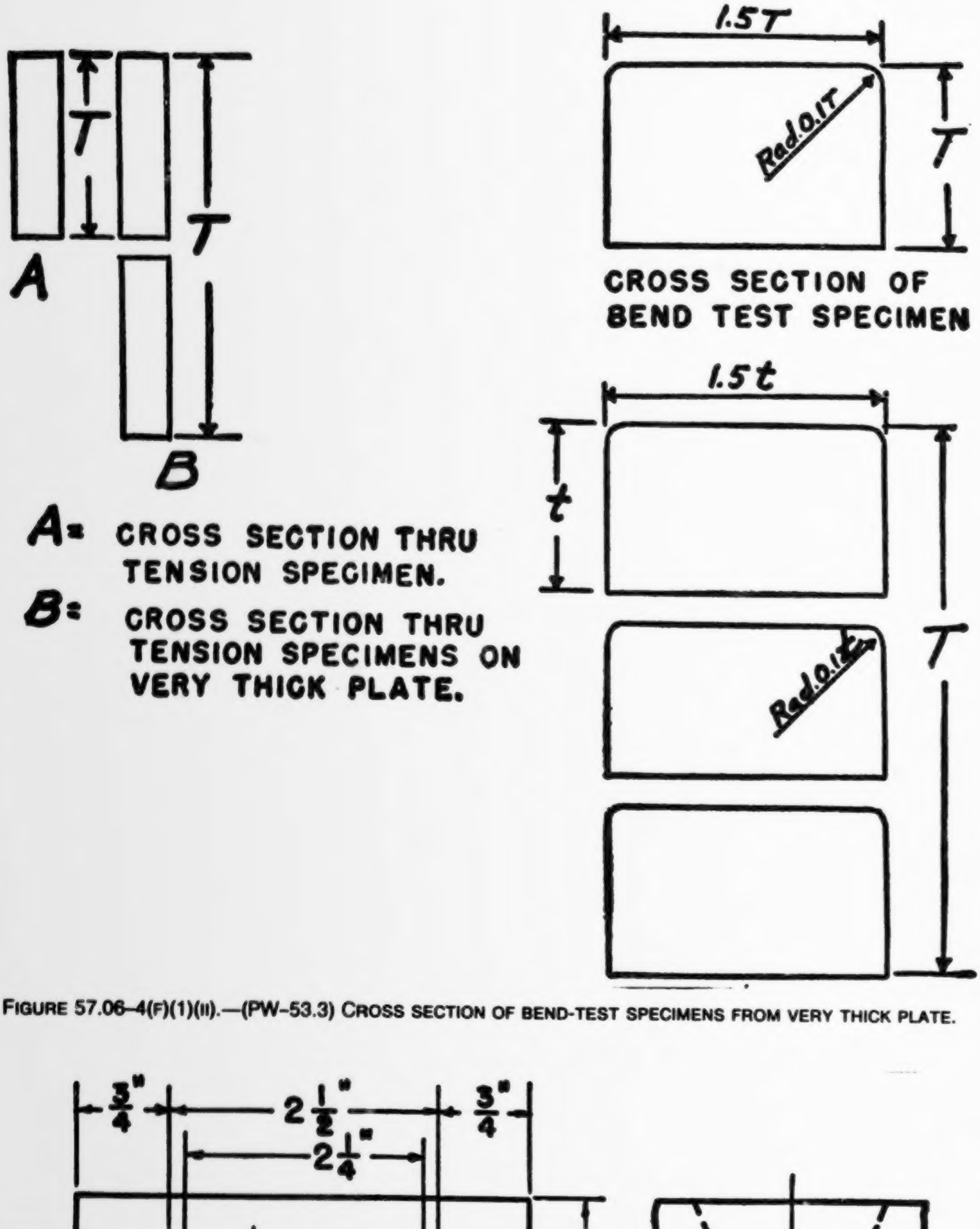

1.5T
Rad. 0.1T
T
CROSS SECTION OF BEND TEST SPECIMEN
T
T
A
B
A= CROSS SECTION THRU TENSION SPECIMEN.
B= CROSS SECTION THRU TENSION SPECIMENS ON VERY THICK PLATE.
1.5t
t
Rad. 0.1t
T

Figure 57.06–4(f)(1)(ii).—(PW–53.3) Cross section of bend-test specimens from very thick plate.

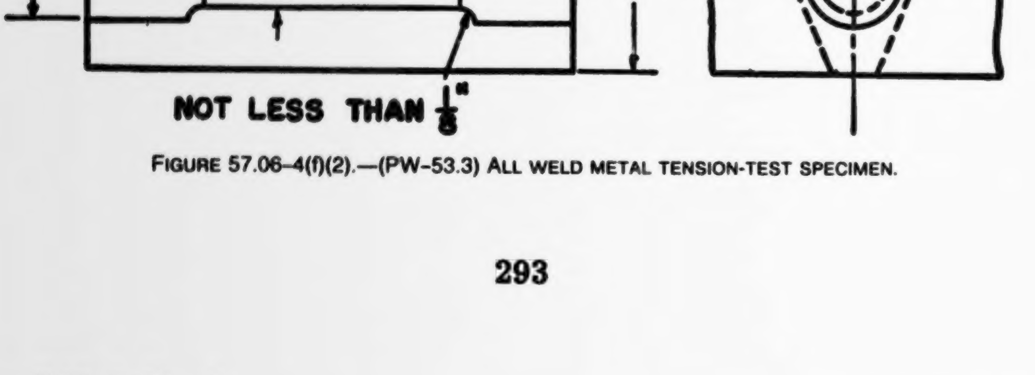
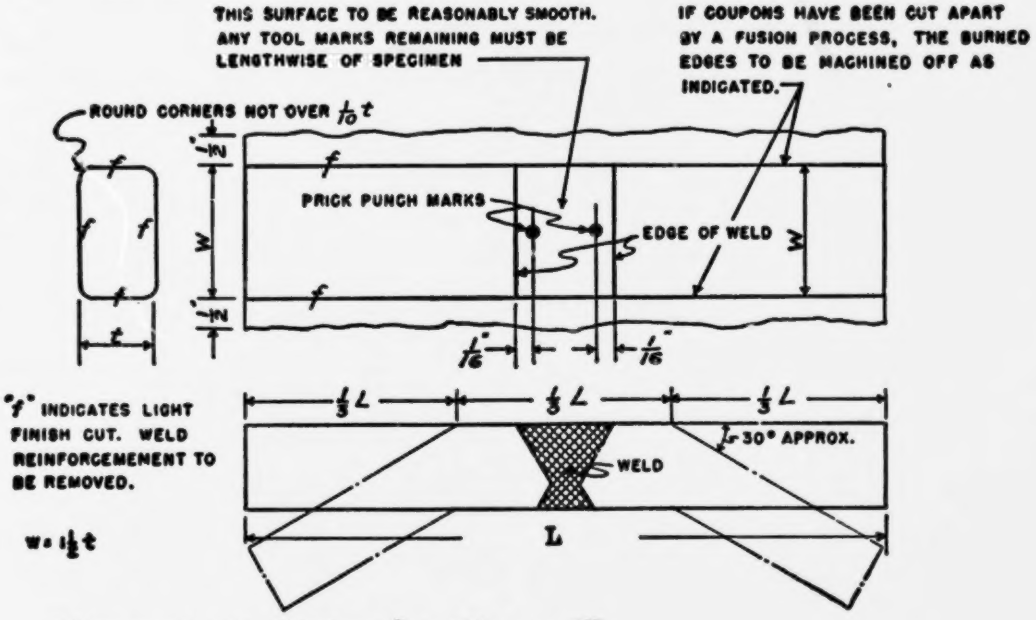

3/4"
2 1/2"
3/4"
2 1/4"
3/4"
1/2" ± 0.01"
T
NOT LESS THAN 1/8"

Figure 57.06–4(f)(2).—(PW–53.3) All weld metal tension-test specimen.

(g) The freebend specimens shall be of the form and dimensions shown in Figure 57.06-4(g). For plates of three-fourths inch or less in thickness one of the specimens shall be bent with the face of the weld in tension. Each free-bend specimen shall be bent cold under freebending conditions until the elongation measured within or across approximately the entire weld on the outer surface of the bend is at least 30 percent, except that for Class II and Class II-L pressure vessels, the minimum elongation shall be 20 percent. When the capacity of the available testing machine will not permit testing a full thickness specimen, the specimen may be cut with a thin saw into as many portions of the thickness as necessary as shown in Figure 57.06-4(f)(1)(ii), provided each such piece retains the proportion of 1½ to 1, width to thickness, each of which shall meet the requirements. Cracks at the corners of the specimens or small defects in the convex surface, the greatest dimensions of which do not exceed one-sixteenth inch need not be considered as failures.


THIS SURFACE TO BE REASONABLY SMOOTH. ANY TOOL MARKS REMAINING MUST BE LENGTHWISE OF SPECIMEN
IF COUPONS HAVE BEEN CUT APART BY A FUSION PROCESS, THE BURNED EDGES TO BE MACHINED OFF AS INDICATED.
ROUND CORNERS NOT OVER 1/10 t
f
f
f
f
t
1/8 IN
W
1/8 IN
PRICK PUNCH MARKS
EDGE OF WELD
W
f
f
1/16"
1/16"
"f" INDICATES LIGHT FINISH CUT. WELD REINFORCEMENENT TO BE REMOVED.
W = 1½ t
⅓ L
⅓ L
⅓ L
30° APPROX.
WELD
L

L(Approximate Minimum) = 3in. + 3V
V = Width of the Surface of the Weld

The Length of the Bend Specimen is Immaterial provided the Bend occurs at the Weld. The Minimum Length indicated is only Suggestive and is Not Mandatory.

FIGURE 57.06-4(g).—(PW-53.8) Specimen for free-bend test.

(h) The guided-bend specimen shall be bent with the side of the weld in tension, its width shall be equal to the full thickness of the plate and its thickness, after machining, shall be 0.350 inch to 0.380 inch to permit bending in a jig having the contour of the standard jig as shown in Figure QW 466.1, QW 466.2, or QW 466.3 of the ASME Code. The specimen shall withstand being bent cold to the full capacity of the jig without developing any crack exceeding one-eighth inch in any direction. Where the plate thickness exceeds two inches, the specimen shall be cut in two so that each portion does not exceed 2 inches in width. Each such portion shall be tested and shall meet the requirements.

(i) One retest shall be made for each of the original specimens which fails to meet the requirements. Should the retests fail to meet the requirements, the welds which they represent shall be chipped out, rewelded and new test plates provided.

[CGFR 68-82, 33 FR 18872, Dec. 18, 1968, as amended by CGFR 69-127R, 35 FR 9080, June 17, 1970; CGD 74-102, 40 FR 27461, June 30, 1975; CGD 80-004, FR 10796, Feb. 10, 1980]

(63 Stat. 545 (14 U.S.C. 633); R.S. 4405 (46 U.S.C. 375, 391a); 70 Stat. 152 (46 U.S.C. 390b); R.S. 4418 (46 U.S.C. 392); R.S. 4428 (46 U.S.C. 406, 409, 41); R.S. 4462 (46 U.S.C. 416, 520p); 49 U.S.C. 1655(b) E.O. 11239 (30 FR 9671))

§ 57.06-5 Production toughness testing.

(a) In addition to the test specimens required by § 57.06-4(a), production toughness test plates shall be prepared for Classes I-L and II-L pressure vessels in accordance with Subpart 54.05 of this subchapter, for Class 1 nuclear vessels in accordance with § 55.10-20(b)(2) of this subchapter, and for Class MC nuclear vessels in accordance with § 55.15-5(c) of this subchapter.

(b) For nonpressure vessel type cargo tanks and associated secondary barriers as defined in § 38.05-4 of Subchapter D (Tank Vessels) of this chapter, production toughness test plates shall be prepared in accordance with Subpart 54.05 of this subchapter.

[CGD 68-82, 33 FR 18872, Dec. 18, 1968, as amended by CGD 72-206R, 38 FR 17229, June 29, 1973]

PART 58—MAIN AND AUXILIARY MACHINERY AND RELATED SYSTEMS

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58.01-5 Applicable standards.
58.01-10 Fuel for internal combustion engines on passenger vessels.
58.01-15 Fuel oil for boilers.
58.01-20 Machinery guards.
58.01-25 Means of stopping machinery.
58.01-30 Trial-trip observance.

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58.03-10 American Society for Testing and Materials (ASTM).
58.03-15 Military specifications (MIL).
58.03-20 National Fire Protection Association (NFPA).
58.03-25 American National Standards Institute (ANSI).
58.03-30 Marine Department, Underwriters Laboratories, Inc. (formerly Yacht Safety Bureau).
58.03-35 American Petroleum Institute (API).

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58.60-7 Industrial systems: piping.
58.60-9 Industrial systems: design.
58.60-11 Analyses, plans, diagrams and specification: submission.
58.60-13 Inspection

AUTHORITY: R.S. 4405, as amended, 4462, as amended, sec. 633, 63 Stat. 545, sec. 6(b)(1), 80 Stat. 938; 46 U.S.C. 375, 416, 14 U.S.C. 633, 49 U.S.C. 1655(b); 49 CFR 1.4 (a)(2), (f), R.S. 4417, as amended, 4417a, as amended, 4418, as amended, 4426-4431, as amended, 4433, as amended, 4434, as amended, 4488, as amended, 4491, as amended, sec. 14, 29 Stat. 690, as amended, sec. 10, 35 Stat. 428, as amended, 41 Stat. 305, as amended, secs. 1, 2, 49 Stat. 1544, 1545, as amended, sec. 17, 54 Stat. 166, as amended, sec. 3, 54 Stat. 347, as amended, sec. 3, 70 Stat. 152, sec. 3, 68 Stat. 675; 46 U.S.C. 391, 391a, 392, 404-409, 411, 412, 481, 489, 366, 395, 363, 367, 526p, 1333, 390b, 50 U.S.C. 198; E.O. 11239, July 31, 1965, 30 FR 9671, 3 CFR, 1965 Supp., unless otherwise noted.

SOURCE: CGFR 68-82, 33 FR 18878, Dec. 18, 1968, unless otherwise noted.

Subpart 58.01—General Requirements

§ 58.01-1 Scope.

The regulations in this Part contain requirements for the design and construction of main and auxiliary machinery installed on vessels.

§ 58.01-5 Applicable standards.

The applicable standards established by the American Bureau of Shipping, or other recognized classification society, may be used as the standard for the design, construction, and testing of main and auxiliary machinery, except as modified in this subchapter.

§ 58.01-10 Fuel for internal combustion engines on passenger vessels.

All internal combustion engines, whether used for main propulsion or auxiliaries, installed on passenger vessels exceeding 100 gross tons, or on passenger vessels engaged in international voyages, shall be driven by fuel having a flashpoint exceeding 110° F. (Pensky-Martens Closed Cup Method, ASTM-D93).

§ 58.01-15 Fuel oil for boilers.

Oil to be used as fuel to be burned under boilers on vessels subject to inspection by the Coast Guard shall have a flashpoint of not less than 140° F. (Pensky-Martens Closed Cup Method, ASTM-D93). Fuels having a lower flashpoint will be considered in those cases where the complete fuel system has been approved by the Commandant.

[CGFR 68-82, 33 FR 18878, Dec. 18, 1968, as amended by CGD 73-254, 40 FR 40168, Sept. 2, 1975]

§ 58.01-20 Machinery guards.

Gears, couplings, flywheels and all machinery capable of injuring personnel shall be provided with adequate covers or guards.

§ 58.01-25 Means of stopping machinery.

Machinery driving forced and induced draft fans, fuel oil transfer pumps, fuel oil unit and service pumps and other similar fuel pumps shall be fitted with remote controls from a readily accessible position outside of the space concerned so that they may be stopped in the event of fire occurring in the compartment in which they are located. These controls shall be suitably protected against accidental operation or tampering and shall be suitably marked. All passenger ships on an international voyage, regardless of the date of construction, shall comply with the requirements of this paragraph. Refer to § 11.50-5(e) of Subchapter J (Electrical Engineering) of this chapter in the case of electrically driven units.

§ 58.01-30 Trial-trip observance.

The operation of main and auxiliary engines, boilers, steering gear, and auxiliaries shall be observed on the trial trip of each new vessel and all deficiencies which affect the safety of the vessel shall be corrected to the satisfaction of the Officer in Charge, Marine Inspection.

Subpart 58.03—Adoption of Standards and Specifications

§ 58.03-1 General.

(a) In this Part portions or the entire text of certain standards and specifications are referred to as the governing requirements for materials, equipment, tests, or procedures to be followed. As stated in Subpart 50.15 of this subchapter, these standards and specification requirements specifically referred to in this Part shall be the governing requirements for the subject matters covered unless specifically limited, modified or replaced by other regulations in this Part.

(b) As used in this part references to applicable standards, such as those established by the American Bureau of Shipping or other classification society and others, means that the Coast Guard uses such standards as guide references with respect to the subjects covered, and under normal conditions accepts machinery, etc., meeting the requirements of such standards. Such standards are not adopted as the governing requirements and made a part of the regulations in this subchapter by reference.

(c) In this subpart are listed the organizations publishing standards and specifications which are adopted by reference.

(Sec. 552, 80 Stat. 383, as amended; 5 U.S.C. 552)

§ 58.03-5 American Boat and Yacht Council, Inc. (ABYC).

(a) The Standards of the American Boat and Yacht Council (see § 50.15-20(a) of this chapter) referenced in this Part are adopted and form a part of this subchapter.

§ 58.03-10 American Society for Testing and Materials (ASTM).

(a) The specifications of the American Society for Testing and Materials (see § 50.15-15 of this chapter) referenced in this Part are adopted and form a part of this subchapter.

§ 58.03-15 Military specifications (MIL).

(a) The military specifications of the Department of Defense (see § 50.15-20(a) of this chapter) referenced in this Part are adopted (except those portions relating to shipment) and form a part of this subchapter.

§ 58.03-20 National Fire Protection Association (NFPA).

(a) The standards of the National Fire Protection Association (see § 50.15-20(a) of this subchapter) referenced in part are adopted and form a part of this subchapter.

§ 58.03-25 American National Standards Institute (ANSI).

(a) The specifications of the American National Standards Institute (see § 50.15-10 of this chapter) referenced in this Part are adopted and form a part of this subchapter.

[CGFR 69-127, 35 FR 9980, June 17, 1970]

§ 58.03-30 Marine Department, Underwriters' Laboratories, Inc. (formerly Yacht Safety Bureau).

(a) The standards of the Marine Department, Underwriters' Laboratories, Inc. (formerly Yacht Safety Bureau) (see § 50.15-20 of this chapter) referenced in this Part are adopted and form a part of this subchapter.

[CGFR 68-82, 33 FR 18878, Dec. 18, 1968, as amended by CGFR 69-127, 35 FR 9980, June 17, 1970; 35 FR 12205, July 30, 1970]

§ 58.03-35 American Petroleum Institute (API).

The standards of the American Petroleum Institute (API)[1] that are referred to in this part are hereby adopted.

(Sec. 2, 87 Stat. 418 (46 U.S.C. 86); sec. 3.82 Stat. 341, as amended (46 U.S.C. 367); R.S. 4405, as amended (46 U.S.C. 375); sec. 10, 35 Stat. 428 (46 U.S.C. 395); R.S. 4423, as amended (46 U.S.C. 400); R.S. 4429, as amended (46 U.S.C. 407); R.S. 4430, as amended (46 U.S.C. 408); 88 Stat. 423 (46 U.S.C. 411); R.S. 4434, as amended (46

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[1] See § 50.15-20(a)(13) for the address of API.

U.S.C. 412); R.S. 4462, as amended (46 U.S.C. 416); sec. 1, 73 Stat. 475 (46 U.S.C. 481); sec. 4, 67 Stat. 462 (43 U.S.C. 1333(d)); sec. 6(b)(1), 80 Stat. 937 (49 U.S.C. 1655(b)(1)); 49 CFR 1.46 (b) and (n)(6))

[CGD 73-251, 43 FR 56801, Dec. 4, 1978]

Subpart 58.05—Main Propulsion Machinery

§ 58.05-1 Material, design and construction.

(a) The material, design, construction and workmanship of main and auxiliary machinery shall be at least equivalent to the standards established by the American Bureau of Shipping or other recognized classification society.

(b) When main and auxiliary machinery is to be installed without classification society review, the builder shall submit in quadruplicate to the cognizant Officer in Charge, Marine Inspection, such drawings and particulars of the installation as are required by the American Bureau of Shipping rules for similar installations on classed vessels.

§ 58.05-5 Astern power.

(a) All vessels shall have sufficient power for going astern to secure proper control of the ship in all normal circumstances.

Subpart 58.10—Internal Combustion Engine Installations

§ 58.10-5 Gasoline engine installations.

(a) *Engine design.* All installations shall be of marine type engines suitable for the intended service, designed and constructed in conformance with the requirements of this subchapter.

(b) *Carburetors.* (1) Drip collectors shall be fitted under all carburetors, except the down-draft type, to prevent fuel leakage from reaching the bilges and so arranged as to permit ready removal of such fuel leakage. Drip collectors shall be covered with flame screens.

NOTE: It is recommended that drip collectors be drained by a device for automatic return of all drip to engine air intakes.

(2) All gasoline engines shall be equipped with an acceptable means of backfire flame control. Installations of backfire flame arresters or engine air and fuel induction systems bearing basic Approval No. 162.015 may be continued in use as long as they are serviceable and in good condition. New installations or replacements shall meet the applicable requirements of this section.

(3) The following are acceptable means of backfire flame control for gasoline engines:

(i) A backfire flame arrester constructed in accordance with the specification regulations contained in Subpart 162.041 of Subchapter Q (Specifications) of this chapter, and specifically approved by the Commandant. The flame arrester shall be suitably secured to the air intake with flametight connection.

(ii) An engine air and fuel induction system which provides adequate protection from propagation of backfire flame to the atmosphere equivalent to that provided by an approved backfire flame arrester. A gasoline engine utilizing an air and fuel induction system, and operated without an approved backfire flame arrester, shall have such installation tested and labelled in accordance with the specifications contained in Subpart 162.042 of Subchapter Q (Specifications) of this chapter, and such system shall be specifically approved by the Commandant.

(iii) Any attachment to the carburetor or location of the engine air induction system by means of which flames caused by engine backfire will be dispersed to the atmosphere outside the vessel in such a manner that the flames will not endanger the vessel, persons on board, or nearby vessels and structures. All attachments shall be of metallic construction with flametight connections and firmly secured to withstand vibration, shock and engine backfire. Such installations do not require formal approval and labelling, but will be accepted by Coast Guard law enforcement officers on the basis of compliance with this subpart.

(iv) Where manufacturers wish to produce vessels having an integrated engine-vessel design, a premarket approval of an engine air induction system is available. Such an installation shall be tested and labelled in accordance with the specifications contained in Subpart 162.043 of Subchapter Q (Specifications) of this chapter, and such system shall be specifically approved by the Commandant.

(c) *Exhaust manifold.* The exhaust manifold shall either be water-jacketed and cooled by discharge from a pump which operates whenever the engine is running, or woodwork within nine inches shall be protected by ¼-inch asbestos board covered with not less than No. 22 USSG (U.S. standard gage) galvanized sheet iron or nonferrous metal. A dead air space of ¼-inch shall be left between the protecting asbestos and the wood, and a clearance of not less than two inches maintained between the manifold and the surface of such protection.

(d) *Exhaust pipe.* (1) Exhaust pipe installations shall conform to the requirements of the American Boat and Yacht Council Standard P-1 "Safe Installation for Exhaust Systems" and National Fire Protection Association Standard NFPA 302, Part 1, section 23 and the following additional requirements:

(i) All exhaust installations with pressures in excess of 15 pounds per square inch gage or employing runs passing through living or working spaces shall meet the material requirements of Part 56 of this subchapter.

(ii) Horizontal dry exhaust pipes are permitted only if they do not pass through living or berthing spaces, they terminate above the deepest load waterline and are so arranged as to prevent entry of cold water from rough or boarding seas, and they are constructed of corrosion resisting material "at the hull penetration."

§ 58.10-10 Diesel engine installations.

(a) The requirements of § 58.10-5 (a), (c), and (d) shall apply to diesel engine installations.

(b) On installations of engines of the semidiesel or hotbulb type, woodwork within 3 feet of starting torches shall be protected by at least ¼-inch asbestos board covered with sheet metal and a dead airspace of at least ¼-inch between the asbestos board and the wood.

(c) A diesel engine air intake on a mobile offshore drilling unit must not be in a classified location.[1]

(d) A diesel engine exhaust on a mobile offshore drilling unit must not discharge into a classified location.[1]

(Sec. 2, 87 Stat. 418 (46 U.S.C. 86); sec. 3, 82 Stat. 341, as amended (46 U.S.C. 367); R.S. 4405, as amended (46 U.S.C. 375); sec. 10, 35 Stat. 428 (46 U.S.C. 395); R.S. 4423, as amended (46 U.S.C. 400); R.S. 4429, as amended (46 U.S.C. 407); R.S. 4430, as amended (46 U.S.C. 408); 88 Stat. 423 (46 U.S.C. 411); R.S. 4434, as amended (46 U.S.C. 412); R.S. 4462, as amended (46 U.S.C. 416); sec. 1, 73 Stat. 475 (46 U.S.C. 481); sec. 4, 67 Stat. 462 (43 U.S.C. 1333(d)); sec. 6(b)(1), 80 Stat. 937 (49 U.S.C. 1655(b)(1)); 49 CFR 1.46 (b) and (n)(6))

[CGFR 68-82, 33 FR 18878, Dec. 18, 1968, as amended by CGD 73-251, 43 FR 56801, Dec. 4, 1978]

§ 58.10-15 Gas turbine installations.

(a) *Standards.* The design, construction, workmanship and tests of gas turbines and their associated machinery shall be at least equivalent to the standards of the American Bureau of Shipping or other recognized classification society.

(b) *Materials.* The materials used for gas turbine installations shall have properties suitable for the intended service. When materials not conforming to standard ASTM specifications are employed, data concerning their properties, including high temperature strength data, where applicable, shall be furnished.

(c) *Exhausts.* (1) Where piping is used for gas turbine exhaust lines, Class II is required as a minimum. (See Subpart 56.04 of this subchapter.) Where the exhaust pressure exceeds 150 pounds per square inch, such as in closed cycle systems, Class I shall be used. Where ducting other than pipe is employed, the drawings and design data shall be submitted to substantiate suitability and safety for the intended service.

(2) Where considered necessary, gas turbines and associated exhaust systems shall be suitably insulated or

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[1] Sections 108.171 to 108.175 of this Chapter define classified locations for mobile offshore drilling units.

cooled, by means of lagging, water spray, or a combination thereof.

(3) Gas turbine exhausts shall not be interconnected with boiler uptakes except for gas turbines used for emergency power and lighting or for emergency propulsion. Dampers or other suitable means shall be installed to prevent backflow of boiler exhaust gases through the turbine. Interconnected exhausts must be specifically approved by the Commandant.

(4) A gas turbine exhaust on a mobile offshore drilling unit must not discharge in a classified location.[1]

(d) *Air inlets.* Air inlets must be designed as follows:

(1) Each air inlet must have means to protect the safety of life and to prevent the entrance of harmful foreign material, including water, into the system.

(2) A gas turbine air inlet must not be in a classified location.[1]

(e) *Noise level.* The standard for the protection of persons from noise exposure is in 41 CFR 50.204.10 except when there is a specific standard approved by the Commandant.

(f) *Cooling and ventilation.* Means shall be provided for circulating air, either natural or forced, through the engine compartment for cooling and ventilation.

(g) *Automatic shutdown.* (1) The control system shall be designed for automatic shutdown of the engine with actuation of audible and visible alarms at shutdown. The visible malfunction indicator shall indicate what condition caused the shutdown and remain visible until reset. Automatic shutdown shall occur under the following conditions:

(i) Overspeed.

(ii) Low lubricating oil pressure. Consideration will be given providing alarm only (without shutdown) in those cases where suitable antifriction bearings are fitted.

(2) Audible or visible alarms shall also be provided for:

(i) Excessive gas temperature, measured at the turbine inlet, gas generator, interstage turbine or turbine exhaust.

(ii) Excessive lubricating oil temperature.

(iii) Excessive speed.

(iv) Reduced lubricating oil pressure.

(3) A remote, manually operated shutdown device shall be provided. Such device may be totally mechanical or may be electrical with a manually actuated switch.

(h) *Drawings and design data.* Drawings and design data of the following components shall be submitted to substantiate their suitability and safety for the service intended:

(1) Combustion chamber.

(2) Regenerator or recuperator.

(3) Casing or piping conveying the gas from the combustion device to the gas turbine.

(i) *Fuel systems.* Gas turbine fuel systems shall meet the requirements of Part 56 of this subchapter.

(j) *Fire extinguishing systems.* A special local fire extinguishing system may be required for gas turbine installations if considered necessary by the Commandant. Such a system would be in addition to any other required in the compartment in which the gas turbine is located.

(Sec. 2, 87 Stat. 418 (46 U.S.C. 86); sec. 3.82 Stat. 341, as amended (46 U.S.C. 367); R.S. 4405, as amended (46 U.S.C. 375); sec. 10, 35 Stat. 428 (46 U.S.C. 395); R.S. 4423, as amended (46 U.S.C. 400); R.S. 4429, as amended (46 U.S.C. 407); R.S. 4430, as amended (46 U.S.C. 408); 88 Stat. 423 (46 U.S.C. 411); R.S. 4434, as amended (46 U.S.C. 412); R.S. 4462, as amended (46 U.S.C. 416); sec. 1, 73 Stat. 475 (46 U.S.C. 481); sec. 4, 67 Stat. 462 (43 U.S.C. 1333(d)); sec. 6(b)(1), 80 Stat. 937 (49 U.S.C. 1655(b)(1)); 49 CFR 1.46 (b) and (n)(6))

[CGFR 68-82, 33 FR 18878, Dec. 18, 1968, as amended by CGFR 72-59R, 37 FR 6190, Mar. 25, 1972; CGD 73-251, 43 FR 56801, Dec. 4, 1978]

Subpart 58.16—Liquefied Petroleum Gases for Cooking and Heating

§ 58.16-1 Scope.

(a) Liquefied petroleum gas may be used for cooking and heating on all vessels subject to inspection by the Coast Guard, except passenger vessels, provided the installation complies with the requirements of this subpart.

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[1] Sections 108.171 to 108.175 of this Chapter define classified locations for mobile offshore drilling units.

(b) It is the intent of the regulations in this subpart to permit liquefied petroleum gas systems of the vapor withdrawal type only. Cylinders designed to admit liquid gas into any other part of the system are prohibited.

(c) All component parts of the system, except cylinders, appliances, and low pressure tubing, shall be designed to withstand a pressure of 500 pounds per square inch without rupture.

§ 58.16-5 Definition.

(a) For the purpose of this subpart the term "liquefied petroleum gas" means any liquefied flammable gas which is composed predominantly of hydrocarbons or mixtures of hydrocarbons, such as propane, propylene, butane, butylene, or butadiene, and which has a Reid (ASTM-D323. Method of test for Vapor Pressure of Petroleum Products (Reid Method)) vapor pressure exceeding 40 pounds per square inch absolute at 100° F.

§ 58.16-10 Approvals.

(a) *Gas appliances.* (1) All gas-consuming appliances used for cooking and heating shall be of a type approved by the Commandant, and shall be tested, listed and labeled by an acceptable laboratory, such as:

(i) The American Gas Association Testing Laboratories.

(ii) The Marine Department, Underwriters' Laboratories, Inc. (formerly Yacht Safety Bureau).

(2) Continuous-burning pilot flames are prohibited for use on gas appliances when installed below the weather deck.

(3) Printed instructions for proper installation, operation, and maintenance of each gas-consuming appliance shall be furnished by the manufacturer.

(b) *Cylinders.* (1) Cylinders in which liquefied petroleum gas is stored and handled shall be constructed, tested, marked, maintained, and retested in accordance with the regulations of the Department of Transportation.

(2) All liquefied petroleum gas cylinders in service shall bear a test date marking indicating that they have been retested in accordance with the regulations of the Department of Transportation.

(3) Regardless of the date of the previous test, a cylinder shall be rejected for further service when it leaks; when it is weakened appreciably by corrosion, denting, bulging or other evidence of rough usage; when it has lost more than 5 percent of its tare weight; or when it has been involved in a fire.

(c) *Safety relief devices.* All safety relief devices where required, shall be approved as to type, size, pressure setting, and location, by the Bureau of Explosives in conformance with the regulations of the Department of Transportation.

(d) *Valves, regulators, and vaporizers.* All component parts of the system, other than cylinders and low pressure distribution tubing between regulators and appliances, shall be tested and approved by and bear the label of the Underwriters Laboratories, Inc., or other recognized testing laboratory.

(e) *Plan approval.* Drawings in triplicate, showing the location and installation of all piping, gas-consuming appliances, cylinders, and other component parts of the system shall be submitted for approval.

[CGFR 68-82, 33 FR 18878, Dec. 18, 1968, as amended by CGFR 69-127, 35 FR 9980 June 17, 1970]

§ 58.16-15 Valves and safety relief devices.

(a) Each cylinder shall have a manually operated screw-down shutoff valve fitted with a handwheel installed directly at the cylinder outlet.

(b) All cylinders shall be protected by one or more safety relief devices complying with the requirements of § 58.16-10(a). The safety relief device shall be a shutoff valve with an integral spring-loaded safety relief valve and supplementary fusible plug, the latter designed to yield when the cylinder has been emptied of liquid gas by the relief valve under conditions of exposure to excessive heat.

(c) Cylinder valves and safety relief devices shall have direct communication with the vapor space of the cylinder.

(d) In addition to the cylinder valve, a multiple cylinder system shall be provided with a two-way positive shutoff manifold valve of the manually operated type. The manifold valve shall be so arranged that the replacement of empty cylinders can be made without shutting down the flow of gas in the system.

(e) A master packless shutoff valve controlling all burners simultaneously shall be installed at the manifold of all gas-consuming appliances.

§ 58.16–16 Reducing regulators.

(a) All systems shall be provided with a regulating device so adjusted as to release gas to the distribution tubing at a pressure not in excess of 18 inches water column, or approximately 10.5 ounces per square inch.

(b) The low pressure side of all regulators shall be protected against excessive pressure by means of a suitable relief valve which shall be integral with the regulator. The relief valve shall be set to start to discharge at a pressure not less than two times and not more than three times the delivery pressure.

(c) All reducing regulators shall be fitted with a pressure gage located on the high pressure side of the regulator.

§ 58.16–17 Piping and fittings.

(a) The piping between the cylinders and the appliances shall be seamless annealed copper tubing or such other seamless tubing as may be approved by the Commandant.

(b) All high pressure tubing between the cylinders and the regulators shall have a minimum wall thickness of 0.049 inch. All low-pressure tubing between the regulator and appliances shall have a minimum wall thickness of 0.032 inch.

(c) Tubing connecting fittings shall be of the flare type; or connections may be soldered or brazed with material having a melting point in excess of 1,000° F.

§ 58.16–18 Installation.

(a) *Cylinders, regulating and safety equipment.* (1) Cylinders, regulating and safety equipment shall be installed in a substantially constructed and firmly fixed metal enclosure located on or above the weather deck. The cylinder enclosure shall have access from the weather deck only. The enclosure shall be provided with top and bottom ventilation consisting of a fresh air inlet pipe and an exhaust pipe both entering through the top of the cylinder housing. The enclosure shall be constructed so that when the access opening is closed, no gas can escape except through the ventilation system.

(2) Cylinders, regulating and safety devices shall be securely fastened and supported within the metal enclosure. The cylinders and high pressure equipment shall be so mounted as to be readily accessible and capable of easy removal for refilling and inspection. The stowage of high pressure equipment in the housing shall be such that the cylinder valves can be readily operated and the pressure gage dial be easily visible. Where possible cylinders shall be mounted in an upright position.

(3) Stowage of unconnected spare cylinders, filled or empty, shall comply with the requirements for cylinders.

(4) All valves, manifolds and regulators shall be securely mounted in locations readily accessible for inspection, maintenance and testing, and shall be adequately protected.

(5) Discharge of the safety relief valves shall be vented away from the cylinder, and insofar as practicable, upward into the open atmosphere, but in all cases so as to prevent impingement of the escaping gas onto a cylinder.

(b) *Piping.* (1) All piping shall be installed so as to provide minimum interior runs and adequate flexibility. The piping at the cylinder outlets shall be fitted with flexible metallic connections to minimize the effect of cylinder movement on the outlet piping.

(2) Distribution lines shall be protected from physical damage and be readily accessible for inspection. Lines shall be substantially secured against vibration by means of soft nonferrous metal clips without sharp edges in contact with the tubing. When passing through decks or bulkheads, the lines shall be protected by ferrules of nonabrasive material. The distribution lines shall be continuous length of tubes

from the regulator to the shutoff valve at the appliance manifold.

(c) *Gas-consuming appliances.* All gas-consuming appliances shall be permanently and securely fastened in place.

(d) *Electrical.* No electrical connections shall be made within the cylinder housing.

§ 58.16-19 Tests.

(a) *Installation.* (1) After installation, the distribution tubing shall be tested prior to its connection to the regulator and appliance by an air pressure of not less than 5 pounds per square inch.

(2) After satisfactory completion of the tests prescribed in paragraph (a)(1) of this section, the distribution tubing shall be connected to the regulator and appliance and the entire system subjected to a leak test as required by § 58.16-30(j).

(b) *Periodic.* Leak tests as required by § 58.16-30(j) shall be conducted at least once each month and at each regular annual or biennial inspection. The tests required at monthly intervals shall be conducted by a licensed officer of the vessel or qualified personnel acceptable to the Officer in Charge, Marine Inspection. The owner, master, or person in charge of the vessel shall keep records of such tests showing the dates when performed and the name(s) of the person(s) and/or company conducting the tests. Such records shall be made available to the marine inspector upon request and shall be kept for the period of validity of the vessel's current certificate of inspection. Where practicable, these records should be kept in or with the vessel's logbook.

§ 58.16-20 Ventilation of compartments containing gas-consuming appliances.

(a) Compartments containing gas-consuming appliances which are located above the weather deck shall be fitted with at least two natural ventilator ducts led from the atmosphere with one extending to the floor level and the other extending to the overhead of the compartment. Powered ventilation may be used provided the motor is outside the compartment.

(b) Compartments in which gas-consuming appliances are located entirely below the weather deck shall be provided with powered ventilation of sufficient capacity to effect a change of air at least once every 6 minutes. The motor for the powered ventilation shall be located outside the compartment.

§ 58.16-25 Odorization.

(a) All liquefied petroleum gases shall be effectively odorized by an agent of such character as to indicate positively by a distinctive odor, the presence of gas down to concentration in air of not over one-fifth the lower limit of combustibility.

§ 58.16-30 Operating instructions.

(a) Before opening a cylinder valve, the outlet of the cylinder shall be connected tightly to system; and in the case where only a single cylinder is used in the system, all appliance valves and pilots shall be shut off before the cylinder valve is opened.

(b) Before opening cylinder valve after connecting it to system, the cylinder shall be securely fastened in place.

(c) When cylinders are not in use their outlet valves shall be kept closed.

(d) Cylinders when exhausted shall have their outlet valves closed.

(e) Nothing shall be stored in the metal enclosure except liquefied petroleum gas cylinders and permanently fastened parts of the system.

(f) Valve protecting caps, if provided, shall be firmly fixed in place on all cylinders not attached to the system. Caps for cylinders in use may remain in the cylinder enclosure if rigidly fastened thereto.

(g) The opening to the cylinder enclosure shall be closed at all times except when access is required to change cylinders or maintain equipment.

(h) Close master valve whenever gas-consuming appliance is not in use.

(i) No smoking is permitted in the vicinity of the cylinder enclosure when access to enclosure is open.

(j) Test system for leakage in accordance with the following procedure: With appliance valve closed, the master shutoff valve on the appliance open, and with one cylinder valve open, note pressure in the gage. Close cylinder valve. The pressure should remain constant for at least 10 minutes. If the pressure drops, locate leakage by application of liquid detergent or soapy water solution at all connections. Never use flame to check for leaks. Repeat test for each cylinder in a multicylinder system.

(k) Report any presence of gas odor to:

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§ 58.16-35 Markings.

(a) The outside of the cylinder enclosure housing liquefied petroleum gas cylinders, valves and regulators shall be marked as follows:

Liquefied Petroleum Gas
Keep Open Fires Away.
Operating Instructions
Inside and In ____________

(b) A durable and permanently legible instruction sign covering safe operation and maintenance of the gas-consuming appliance shall be installed adjacent to the appliance.

(c) "Operating Instructions" as listed in § 58.16-30 shall be framed under glass, or other equivalent, clear, transparent material, in plainly visible locations on the outside of the metal enclosure and near the most frequently used gas-consuming appliance, so they may be easily read.

Subpart 58.20—Refrigeration Machinery

§ 58.20-1 Scope.

(a) The regulations in this subpart apply to fixed refrigeration systems for air conditioning, refrigerated spaces, cargo spaces, and reliquefaction of low temperature cargo installed on vessels.

(b) The regulations in this subpart shall not apply to small self-contained units.

§ 58.20-5 Design.

(a) Refrigeration machinery may be accepted for installation provided the design, material, and fabrication comply with the applicable requirements of the American Bureau of Shipping or other recognized classification society. The minimum pressures for design of all components shall be those listed for piping in Table 501.2.4 of ANSI-B31.5 (Refrigeration Piping). In no case shall pressure components be designed for a pressure less than that for which the safety devices of the system are set. Pressure vessels will be designed in accordance with Part 54 of this subchapter.

(b) For refrigeration systems other than those for reliquefaction of cargo, only those refrigerants listed in § 147.05-100 of Subchapter N (Dangerous Cargoes) of this chapter are allowed.

[CGFR 68-82, 33 FR 18878, Dec. 18, 1968, as amended by CGFR 69-127, 35 FR 9980, June 17, 1970]

§ 58.20-10 Pressure relieving devices.

(a) Each pressure vessel containing refrigerants, which may be isolated, shall be protected by a relief valve set to relieve at a pressure not exceeding the maximum allowable working pressure of the vessel. When a pressure vessel forms an integral part of a system having a relief valve, such vessel need not have an individual relief valve.

(b) Relief valves fitted on the high pressure side may discharge to the low pressure side before relieving to atmosphere. When relieving to atmosphere, a relief valve shall be fitted in the atmospheric discharge connection from the receivers and condensers. The relief valve from the receivers may relieve to the condenser which in turn may relieve either to the low side or to atmosphere. It shall be set to relieve at a pressure not greater than the maximum allowable working pressure. A rupture disk may be fitted in series with the relief valve, provided the bursting pressure of the rupture disk is not in excess of the relief valve set pressure. Where a rupture disk is fitted on the downstream side of the relief valve, the relief valve shall be of the type not affected by back pressure.

§ 58.20-15 Installation of refrigerating machinery.

(a) Where refrigerating machines are installed in which anhydrous ammonia is used as a refrigerant, such machines shall be located in a well-ventilated, isolated compartment, preferably on the deck, but in no case shall it be permissible to install such machines in the engineroom space unless the arrangement is such as to eliminate any hazard from gas escaping to the engineroom. Absorption machines using a solution of aqua ammonia and machines using carbon dioxide are exempt from this requirement, provided the maximum charges that might be released in the event of breakage do not exceed 300 pounds.

(b) Machinery compartments containing equipment for ammonia shall be fitted with a sprinkler system providing an effective water spray and having a remote control device located outside the compartment.

(c) All refrigeration compressor spaces shall be effectively ventilated and drained and shall be separated from the insulated spaces by a waterweight bulkhead, unless otherwise approved.

§ 58.20-20 Refrigeration piping.

(a) All piping materials shall be suitable for handling the primary refrigerant, brine, or fluid used, and shall be of such chemical and physical properties as to remain ductile at the lowest operating temperature.

(b) Piping systems shall be designed in accordance with ANSI-B31.5. Piping used for cargo reliquefaction systems shall also comply with the applicable requirements found in low temperature piping, § 56.50-105 of this subchapter.

(c) A relief valve shall be fitted on or near the compressor on the gas discharge side between the compressor and the first stop valve with the discharge therefrom led to the suction side. A check valve shall be fitted in the atmospheric discharge line if it is led through the side of the vessel below the freeboard deck, or a shutoff valve may be employed if it is locked in the open position.

[CGFR 68-82, 33 FR 18878, Dec. 18, 1968, as amended by CGFR 69-127, 35 FR 9980, June 17, 1970]

§ 58.20-25 Tests.

(a) All pressure vessels, compressors, piping, and direct expansion cooling coils shall be leak tested after installation to their design pressures, hydrostatically or pneumatically.

(b) No pneumatic tests in refrigeration systems aboard ships shall be made at pressures exceeding the design pressure of the part of the system being tested. Pneumatic tests may be made with the refrigerant in the system or if the refrigerant has been removed, oil-pumped dry nitrogen or bone dry carbon dioxide with a detectable amount of the refrigerant added, should be used as a testing medium. (Carbon dioxide should not be used to leak test an ammonia system.) In no case should air, oxygen, any flammable gas or any flammable mixture of gases be used for testing.

Subpart 58.25—Steering Apparatus

§ 58.25-1 Steering apparatus; existing installations.

(a) All existing vessels subject to inspection by the Coast Guard shall be provided with suitable steering apparatus. Extra steering apparatus consisting of relieving cables, or of auxiliary power-or hand-steering gear attached to the rudder stock independent of the regular steering gear, shall be provided.

(b) Replacements of steering apparatus on existing vessels shall be in accordance with this subpart for new installations.

§ 58.25-5 Steering apparatus; new installations.

(a) All new vessels subject to inspection by the Coast Guard, except towed barges, shall be provided with main and auxiliary steering apparatus in accordance with §§ 58.25-10 through 58.25-70.

(b) The main steering gear shall be of adequate strength and of sufficient capacity to steer the vessel at maximum service speed. The main steering gear and rudder stock shall be so designed that they are not damaged at maximum astern speed.

(c) The auxiliary steering gear shall be independent of the main steering gear and shall be of adequate strength and of sufficient capacity to steer the vessel at navigable speed and capable of being brought speedily into action in an emergency.

(d) When the steering gear is power operated, the exact position of the rudder shall be indicated at the main steering station.

§ 58.25-10 Rudder movement.

(a) The main steering gear shall be capable of putting the rudder over from 35° on one side to 35° on the other side with the vessel running ahead at the maximum continuous rated shaft r.p.m. (revolutions per minute). The timing shall be conducted from 35° on one side through 30° on the other side, and the average rate of the rudder shall be not less than 2⅓ per second.

(b) The auxiliary steering gear where power-driven shall be capable of putting the rudder over from 15° on one side to 15° on the other side in 60 seconds with the vessel running head at half speed, or 7 knots whichever is greater.

§ 58.25-15 Plan approval.

(a) General arrangement plans of the main and auxiliary steering arrangements and piping systems shall be submitted for approval in accordances with Subpart 50.20 of this subchapter.

§ 58.25-20 Power-driven steering gear.

(a) The main steering gear shall be power driven for vessels over 250 feet in length or when the required upper rudder stock diameter is over 9 inches. However, power-driven main steering gear shall be required for any vessel where the hand steering gear is not considered capable of effectively complying with the requirements of § 58.25-10.

(b) The auxiliary steering gear shall be power driven when the required upper rudder stock diameter is over 9 inches for passenger vessels and over 14 inches for cargo vessels.

§ 58.25-25 Auxiliary means of steering.

(a) An auxiliary means of steering will not be required where the main gear is of the dual-power hydraulic type, having two independent pumps and connections and separate leads to the pump prime movers from the source of power, and each independent steering gear power unit has the required capacity for a main steering gear in order to meet the requirements of § 58.25-10(a). In such cases the attachment to the rudder stock shall be designed for strength in excess of that of the rudder stock.

(b) A suitable arrangement of block and tackle will be acceptable as an auxiliary steering means, and when arranged for operation by means of power-driven winches or similar machinery, will be considered an auxiliary power steering gear.

(c) An auxiliary means of steering will not be required on double-ended ferryboats where independent steering gears are fitted at each end of the vessel, and two sources of power are provided where the gear is power driven.

§ 58.25-30 Steadying the rudder.

(a) All oceangoing vessels requiring power gears shall be provided with arrangements for steadying the rudder in the event of an emergency and when a change of gear is required. On hydraulic type steering gears a suitable arrangement of stop valves in the main piping may be considered as a means of steadying the rudder.

§ 58.25-35 Rudder stops.

(a) Main power steering gear shall be provided with positive arrangements for stopping the gear before the rudder stops are reached. These arrangements shall be synchronized with the rudder stock or the position of the gear itself, rather than with the steering gear control system.

(b) Strong and effective rudder stops are to be fitted. Where adequate positive stops are provided within the gear, structural stops will not be required.

§ 58.25-40 Buffers.

(a) On vessels in ocean, coastwise, and Great Lakes service, steering gears other than the hydraulic type shall be designed with suitable buffer arrangements to relieve the gear from shocks to the rudder.

§ 58.25-45 Pilothouse steering gear controls.

(a) Control of the main steering gear shall be provided from the pilothouse by mechanical, hydraulic, electrical, or other approved means. The arrangement of the control system and steering gear components shall provide full followup control of the rudder. Supplementary steering control not employing full followup may also be provided from the pilothouse.

(b) Any power required for the pilothouse steering control systems shall be supplied from the steering gear room. Means shall be provided in the steering gear room to disconnect the steering control system from the power source.

§ 58.25-50 Alternative steering station steering gear controls.

(a) An alternative steering station shall be provided from which control of the main steering gear can be effected by mechanical, hydraulic, electrical, or other approved means. The alternative steering station shall be located on the after weather deck unless duplicate pilothouse control means are provided in accordance with § 58.25-55. The arrangement of the alternative steering control system and the steering gear components shall provide full followup control of the rudder unless a suitable rudder angle indicator is provided at the alternative steering station.

(b) Means shall be provided to enable orders to be transmitted from the pilothouse to the alternative steering station.

(c) Components of the alternative steering station control system shall be completely separate and independent of the pilothouse steering control system. The shafting, piping, or electrical cable associated with the control means at the alternative steering stations shall be run as widely separated as practicable from the shafting, piping, or electrical cable of the pilothouse steering control systems.

(d) Any power required for the alternative steering control means shall be supplied from the steering gear room. Means shall be provided in the steering gear room to disconnect the alternative steering means from the source of power and, if necessary, from the associated steering gear.

(e) Where it is not practicable to comply with the requirements of this section because of the arrangement of the vessel or the type of steering gear installed, other types of steering gear control systems may be considered. Such systems shall provide steering gear control equivalent to that required by this section. Ease of maintenance, accessibility, and location and arrangement of components, as well as the type of control system, will be among the factors evaluated when determining equivalency.

§ 58.25-55 Duplicate pilothouse steering gear control systems.

(a) Two separate and independent steering control systems shall be provided for controlling the steering gear from the pilothouse when the alternative steering means is not located on the after weather deck.

(b) Duplicate pilothouse steering gear controls, when installed, shall comply with the following requirements:

(1) Where the steering gear is power-driven, the arrangements of the equipment shall be such that full followup control of the rudder is provided with either of the control systems in use. Supplementary steering control not employing followup may be incorporated.

(2) Means shall be provided in the pilothouse to select either of the two control systems to be in control of the rudder. An "off" position which will disconnect power to both systems may be provided in the pilothouse. Interlocks shall be provided for this control system selector so that only one may be in use at a time.

(3) Any power required for the pilothouse steering control systems shall be supplied from the steering gear room. Means shall be provided in the

steering gear room to disconnect remote steering gear control systems from the source of power.

(4) The shafting, piping, or electric cables of the two pilothouse steering control systems shall be run as widely separated as practicable throughout their length between the pilothouse and the steering gear room.

(c) Where only the main steering gear is power-driven, arrangements shall be such that either steering control system may be connected to control the main steering gear. Where both the main and auxiliary steering gears are power-driven, one steering control system shall control the main steering gear and the other shall control the auxiliary steering gear.

(d) For dual-power hydraulic type steering gears, of such a type that an auxiliary means of steering is not required, one control system shall control only one hydraulic unit and the other control system shall control only the other hydraulic unit.

[CGFR 68-82, 33 FR 18878, Dec. 18, 1968, as amended by CGFR 69-127, 35 FR 9980, June 17, 1970]

§ 58.25-60 Arrangement of steering wheels.

(a) Steering wheels, including "trick wheels" which are used as the alternative steering means, shall turn in a clockwise direction for "right rudder" and counterclockwise for "left rudder." When running ahead, the ship's heading shall be to the right, following clockwise movement of the wheel.

(b) The arrangement of steering stations shall be such that the helmsman is abaft the wheel. However, if a wheel is fitted in the steering gear room, and is intended solely for warming up and testing the gear, the helmsman need not stand abaft the wheel. The rims of the wheels shall be plainly marked with arrows and lettering for right and for left rudder, or a suitable notice indicating these directions shall be posted directly in the helmsman's line of vision.

§ 58.25-65 Special steering apparatus.

(a) Where no regular rudder is fitted and steering action is obtained by a change of setting of the propelling unit, auxiliary steering is not required, nor will the requirements of this subpart be generally applicable. Special consideration will be given by the Commandant for such installations.

(b) When a lever type control is provided instead of a wheel type, it shall be installed and marked so that the lever movement clearly indicates the direction and amount of the rudder movement.

§ 58.25-70 Steering gear piping.

(a) The arrangement of piping for hydraulic steering gears shall be such that a change from the main to the auxiliary gear can be readily effected.

(b) A relief valve shall be provided for the protection of the hydraulic system.

(c) Pressure piping shall meet the requirements of Subpart 58.30.

Subpart 58.30—Fluid Power and Control Systems

§ 58.30-1 Scope.

(a) This subpart contains requirements for fluid power transmission and control systems and appurtenances. Except as otherwise provided for in this section, these requirements are applicable to the following fluid power and control systems:

(1) Steering apparatus, main and auxiliary, including bow thruster systems.

(2) Cargo hatch operating systems unless fitted with an alternate mechanical means of operation and approved by the Commandant as hydraulically or pneumatically fail-safe. A system is considered to be fail-safe if a component failure will result in a slow and controlled release of the loading so as not to endanger personnel.

(3) Watertight door operating system.

(4) Automatic propulsion boiler system.

(5) Starting systems for internal combustion engines used for main propulsion, main or auxiliary power, as the prime mover for any required emergency apparatus, or as the source of propulsion power in ship maneuvering thruster systems.

(6) Centralized control system of main propulsion and auxiliary machinery.

(7) Lifeboat handling equipment.

(8) Controllable pitch propeller system.

(9) Installations used to remotely control components of piping systems listed in § 56.01-10(c)(1) of this subchapter.

(10) All systems containing a pneumatic or hydropneumatic accumulator. In the case of hydropneumatic accumulators where it can be shown to the satisfaction of the Commandant that due to friction losses, constriction, or other design features, the hazard of explosive rupture does not exist downstream of a certain point in the hydraulic system, the requirements of this subpart will apply only to the accumulator and the system upstream of this point.

(11) Materials and/or personnel handling equipment systems, i.e. cranes, hydraulic elevators, etc., not approved by the Commandant as fail-safe as defined in paragraph (a)(2) of this section.

(12) Any fluid power or control system installed in the cargo area of pump rooms on a tank vessel, or in spaces in which cargo is handled on a liquefied flammable gas carrier.

(13) All pneumatic power and control systems having a maximum allowable working pressure in excess of 150 pounds per square inch.

(14) Any other hydraulic or pneumatic system on board that, in the judgment of the Commandant, constitutes a hazard to the seaworthiness of the ship or the safety of personnel either in normal operation or in case of failure.

(b) Other fluid power and control systems do not have to comply with the detailed requirements of this subpart but must meet the requirements of § 58.30-50.

[CGFR 68-82, 33 FR 18878, Dec. 18, 1968, as amended by CGD 73-254, 40 FR 40168, Sept. 2, 1975]

§ 58.30-5 Design requirements.

(a) The requirements of Part 56 are also applicable, except as modified herein. The designer should consider the additional pressure due to hydraulic shock and should also consider the rate of pressure rise caused by hydraulic shock. Specific shock test requirements for components fabricated of cast material are contained in § 58.30-15(f).

(b) The system shall be so designed that proper functioning of any unit shall not be affected by the back pressure in the system. The design shall be such that malfunctioning of any unit in the system will not render any other connected or emergency system inoperative because of back pressure.

(c) Pneumatic systems with a maximum allowable working pressure in excess of 150 pounds per square inch shall be designed with a surge tank or other acceptable means of pulsation dampening.

[CGFR 68-82, 33 FR 18878, Dec. 18, 1968, as amended by CGFR 69-127, 35 FR 9980, June 17, 1970; CGD 73-254, 40 FR 40168, Sept. 2, 1975]

§ 58.30-10 Hydraulic fluid.

(a) The requirements of this section are applicable to all fluid power transmission and control systems installed on vessels subject to inspection.

(b) The fluid used in hydraulic power transmission systems shall have a flashpoint of not less than 200° F. for pressures below 150 pounds per square inch and 315° F. for pressures 150 pounds per square inch and above, as determined by ASTM D92-57, Cleveland "Open Cup" test method.

(c) The chemical and physical properties of the hydraulic fluid shall be suitable for use with any materials in the system or components thereof.

(d) The hydraulic fluid shall be suitable for operation of the hydraulic system through the entire temperature range to which it may be subjected in service.

(e) The recommendations of the system component manufacturers and ANSI-B93.5 (Recommended Practice for the Use of Fire Resistant Fluids for Fluid Power Systems) shall be considered in the selection and use of hydraulic fluid.

[CGFR 68-82, 33 FR 18878, Dec. 18, 1968, as amended by CGFR 69-127, 35 FR 9980, June 17, 1970]

§ 58.30-15 Pipe, tubing, valves, fittings, pumps, and motors.

(a) The requirements of this section are applicable to those hydraulic and pneumatic systems listed in § 58.30-1.

(b) Materials used in the manufacture of tubing, pipes, valves, flanges, and fittings shall be selected from those specifications which appear in Table 56.60-1(a) or Table 56.60-2(a) of this subchapter; or they may be selected from the material specifications of sections I, III, and VIII of the ASME Code if not prohibited by the section of this subchapter dealing with the particular section of the ASME Code. Materials designated by other specifications shall be evaluated on the basis of physical and chemical properties. To assure these properties, the specifications shall specify and require such physical and chemical testing as considered necessary by the Commandant. All tubing and pipe materials shall be suitable for handling the hydraulic fluid used and shall be of such chemical and physical properties as to remain ductile at the lowest operating temperature.

(c) Bolting shall meet the requirements of § 56.25-20 of this subchapter except that regular hexagon bolts conforming to SAE J429, grades 2 through 8, or ASTM A-193 may be used in sizes not exceeding 11/2 inches.

(d) The maximum allowable working pressure and minimum thickness shall be calculated as required by § 56.07-10(e) of this subchapter when the outside diameter to wall thickness ratio is greater than 6. Where the ratio is less than 6, the wall thickness may be established on the basis of an applicable thick-wall cylinder equation acceptable to the Commandant using the allowable stress values specified in 56.07-10(e) of this subchapter.

(e) All flared, flareless and compression type joints shall be in accordance with § 56.30-25 of this subchapter.

(f) Acceptable cast material as tabulated in § 56.60-1(a) and (b) of this subchapter may be used in the construction of valves and fittings designed for hydraulic systems. Prior to the use of such parts for pressure in excess of 150 pounds per square inch gage, each design shall be subjected to a shock test by a recognized testing laboratory and shall show no fracture when subjected to the impact test requirements of § 58.30-17. Materials complying with a ferrous specification having a minimum elongation of 15 percent in 2 inches or with cast aluminum alloy specifications having a minimum elongation of 10 percent in 2 inches need not be so tested.

(g) Fluid power motors and pumps installed on vessels subject to inspection shall be certified by the manufacturer as suitable for the intended use. Such suitability shall be demonstrated by operational tests conducted aboard the vessel which shall be witnessed by a marine inspector.

[CGFR 68-82, 33 FR 18878, Dec. 18, 1968, as amended by CGD 73-254, 40 FR 40168, Sept. 2, 1975]

§ 58.30-17 Procedure for impact shock test of hydraulic cast iron and cast aluminum products.

(a) *Shock testing machine.* The machine for conducting these tests shall be as described in Military Specification MIL-S-901 for testing light equipment of approximately 250 pounds maximum weight.

(b) *Component mounting.* The component or components shall be mounted on a steel base plate manifold assembly; the latter shall be secured rigidly bolted to the anvil of the shock testing machine. Components of unlike designs may be mounted on the same base plate.

(c) *Test procedure.* (1) The manufacturer shall furnish sample stock valves, fittings, or other components of each design and size he desires to have tested. Three blows shall be applied to each of the principal axes of the item assembly being tested or a total of nine blows to each assembly employing the test apparatus described in paragraph (a) of this section. The three blows to be applied from the different directions shall be with heights of hammer drops of from 1, 3, and 5 feet each. While under test, the assembly shall be subjected to a hydrostatic pressure equal to the pressure rating marked on the valves to insure there is no leakage.

(2) A stock component of each design and size shall be subjected to a proof test of at least four times the pressure rating marked on the item prior to or after the shock test specified in paragraph (c)(1) of this section.

(d) *Testing agency.* Tests shall be conducted by a testing laboratory acceptable to the Commandant. The testing laboratory shall furnish a written report to the Commandant, U.S. Coast Guard, stating that the tests were carried out as prescribed in this section and furnishing the results of the tests. All costs connected with the tests shall be borne by the manufacturer.

(e) *Acceptability of products.* The acceptability is contingent upon the valves passing the tests prescribed in this section without visual evidence of fracture, distortion or rupture of the cast iron body. Components that have been subjected to a hydrostatic proof test in excess of twice the pressure rating marked on the component shall not be installed on vessels to which this part applies.

[CGFR 68-82, 33 FR 18878, Dec. 18, 1968, as amended by CGD 72-104R, 37 FR 14233, July 18, 1972]

§ 58.30-20 Fluid power hose and fittings.

(a) The requirements of this section are applicable to those hydraulic and pneumatic systems listed in § 58.30-1.

(b) Hose and fittings shall meet the requirements of Subpart 56.60 of this subchapter.

(c) Hose assemblies may be installed between two points of relative motion but shall not be subjected to torsional deflection (twisting) under any conditions of operation and shall be limited, in general, to reasonable lengths required for flexibility. Special consideration may be given to the use of longer lengths of flexible hose where required for proper operation of machinery and components in the hydraulic system.

(d) Sharp bends in hoses shall be avoided.

§ 58.30-25 Accumulators.

(a) An accumulator is an unfired pressure vessel in which energy is stored under high pressure in the form of a gas or a gas and hydraulic fluid. Accumulators shall be constructed under the provisions of Part 54 of this subchapter or as may be authorized by the Commandant.

(b) If the accumulator is of the gas and fluid type, suitable separators shall be provided between the two media, if their mixture would be dangerous, or would result in contamination of the hydraulic fluid and loss of gas through absorption.

(c) Each accumulator which may be isolated, shall be protected on the gas and fluid sides by relief valves set to relieve at pressures not exceeding the maximum allowable working pressures. When an accumulator forms an integral part of systems having relief valves, the accumulator need not have individual relief valves.

§ 58.30-30 Fluid power cylinders.

(a) The requirements of this section are applicable to those hydraulic and pneumatic systems listed in § 58.30-1 and to all pneumatic power transmission systems.

(b) Fluid power cylinders consisting of a container and a movable piston rod extending through the containment vessel, not storing energy but converting a pressure to work, are not considered to be pressure vessels and need not be constructed under the provisions of Part 54 of this subchapter.

(c) Cylinders shall be designed for a bursting pressure of not less than 4 times the maximum allowable working pressure. Drawings and calculations or a certified burst test report shall be submitted to show compliance with this requirement.

(d) Piston rods, except steering gear rams, shall either be of corrosion resistant material or shall be of steel protected by a plating system acceptable to the Commandant.

(e) Materials selection shall be in accordance with the requirements of § 58.30-15(b).

§ 58.30-35 Testing.

(a) All fluid power and control systems and components thereof shall be tested as required by this section.

(b) Accumulators constructed as pressure vessels under the provisions of Part 54 of this subchapter shall be tested and retested as required by Parts 54 and 61 of this subchapter.

(c) Fluid power and control systems and piping assemblies shall be given an installation test as follows:

(1) Fluid power and control systems and piping assemblies and associated equipment components, including hydraulic steering gear, in lieu of being tested at the time of installation, may be shop tested by the manufacturer to 1½ times the maximum allowable pressure of the system. The required test pressure shall be maintained for a sufficient amount of time to check all components for strength and porosity and to permit an inspection to be made of all connections.

(2) Fluid power and control systems and associated hydraulic equipment components which have been tested in conformance with paragraph (c)(1) of this section and so certified by the manufacturer, may be tested after installation as a complete assembly by stalling the driven unit in a safe and satisfactory manner and by blowing the relief valves. Otherwise, these systems shall be hydrostatically tested in the presence of a marine inspector at a pressure of 1½ times the maximum allowable pressure.

(3) Fluid power and control systems incorporating hydropneumatic accumulators containing rupture discs may be tested at the maximum allowable working pressure of the system in lieu of 1½ times this value as prescribed in paragraphs (c)(1) and (2) of this section provided the accumulators have been previously tested in accordance with paragraph (b) of this section and welded or brazed piping joints are not employed in the system. If welded or brazed joints are employed, the system shall be tested in accordance with the requirements of paragraphs (c)(1) and (2) of this section except that the accumulators may be isolated from the remainder of the system.

(d) Fluid power and control systems shall be purged with an inert gas or with the working fluid and all trapped air bled from the system prior to any shipboard testing. In no case shall air, oxygen, any flammable gas, or any flammable mixture of gases be used for testing fluid power systems.

(e) Fluid control systems, such as boiler combustion controls, containing components with internal parts, such as bellows or other sensing elements, which would be damaged by the test pressure prescribed in paragraphs (c)(1) and (2) of this section may be tested at the maximum allowable working pressure of the system. In addition, all fluid control systems may be tested using the system working fluid.

§ 58.30-40 Plans.

(a) Diagrammatic plans and lists of materials must be submitted for each of the fluid power and control systems listed in § 58.30-1(a) that is installed on the vessel. Plan submission must be in accordance with Subpart 50.20 of this subchapter and must include the following:

(1) The purpose of the system.

(2) Its location on the vessel.

(3) The maximum allowable working pressure.

(4) The fluid used in the system.

(5) The velocity of the fluid flow in the system.

(6) Details of the system components in accordance with § 56.01-10(d) of this subchapter.

[CGD 73-254, 40 FR 40168, Sept. 2, 1975]

§ 58.30-50 Requirements for miscellaneous fluid power and control systems.

(a) All fluid power and control systems installed on a vessel, except those listed in § 58.30-1(a), must meet the following requirements:

(1) Diagrams of the system providing the information required by § 58.30-40(a)(1) through (4) must be submitted. These are not approved but are needed for records and for evaluation of the system in accordance with § 58.30-1(a)(14).

(2) The hydraulic fluid used in the system must comply with § 58.30-10

(3) The installed system must be tested in accordance with § 58.30-35(c)(2).

(4) All pneumatic cylinders must comply with § 58.30-30.

(5) Additional plans may be required for "fail-safe" equipment and for cargo hatch systems with alternate means of operation.

[CGD 73-254, 40 FR 40168, Sept. 2, 1975]

Subpart 58.50—Independent Fuel Tanks

§ 58.50-1 General requirements.

(a) The regulations in this subpart contain requirements for independent fuel tanks.

(b) Passenger vessels exceeding 100 gross tons constructed prior to July 1, 1935, may carry gasoline as fuel not exceeding 40 gallons to supply the emergency electrical system. Passenger vessels exceeding 100 gross tons constructed on or after July 1, 1935, and all emergency systems converted on or after July 1, 1935, shall use fuel which has a flashpoint exceeding 110° F. (PMCC) for internal combustion engine units. Such vessels shall carry a sufficient quantity of fuel to supply the emergency electrical system. Refer to § 112.05-5 of Subchapter J (Electrical Engineering), of this chapter.

(c) An outage of 2 percent shall be provided on all fuel tanks containing petroleum products.

[CGFR 68-82, 33 FR 18878, Dec. 18, 1968, as amended by CGD 73-254, 40 FR 40169, Sept. 2, 1975]

§ 58.50-5 Gasoline fuel tanks.

(a) *Construction.* (1) *Shape.* Tanks may be of either cylindrical or rectangular form, except that tanks for emergency electrical systems shall be of cylindrical form.

(2) *Materials and construction.* The material used and the minimum thickness allowed shall be as indicated in Table 58.50-5(a) except that consideration will be given to other materials which provide equivalent safety as indicated in § 58.50-15.

(3) *Prohibited types.* Tanks with flanged-up top edges that may trap and hold moisture shall not be used.

(4) *Openings.* Openings for fill, vent and fuel pipes, and openings for fuel level gages where used, shall be on the topmost surface of tanks. Tanks shall have no openings in bottoms, sides, or ends, except that an opening fitted with threaded plug or cap may be used for tank cleaning purposes.

TABLE 58.50-5(a)

Material	A.S.T.M. specification (latest edition)	Thickness in inches and gage numbers[1] vs. tank capacities for—		
		1-through 80-gallon tanks	More than 80- and not more than 150-gallon tanks	Over 150-gallon tanks[2]
Aluminum[5]	B 209, Alloy 5086[6]	0.250 (USSG 3)	0.250 (USSG 3)	0.250 (USSG 3).
Nickle-copper	B127, Hot rolled sheet or plate.	0.037 (USSG 20)[3]	0.050 (USSG 18)	0.107 (USSG 12).
Copper-nickel	B122, Alloy No. 5	0.045 (AWG 17)	0.057 (AWG 15)	0.128 (AWG 8).
Copper	B152, Type ETP	0.057(AWG 15)	0.080 (AWG 12)	0.182 (AWG 5).
Copper-silicon	B97, Alloys A, B, and C	0.050 (AWG 16)	0.064 (AWG 14)	0.144 (AWG 7).
Steel or iron[4]		0.0747 (MfgStd 14)	0.1046 (MfgStd 12)	0.179 (MfgStd 7).

[1] Gages used are U.S. standard "USSG" for nickel-copper; "AWG" for copper, copper-nickel and copper-silicon "MFR's STD" for steel.

[2] Tanks over 400 gallons shall be designed with a factor of safety of four on the ultimate strength of the material used with a design head of not less than 4 feet of liquid above the top of the tank.

[3] Nickel-copper not less than 0.031 inch (USSG 22) may be used for tanks up to 30-gallon capacity.

[4] Fuel tanks constructed of iron or steel, which is less than 3/16-inch thick shall be galvanized inside and outside by the hot dip process.

[5] Anodic to most common metals. Avoid dissimilar metal contact with tank body.

[6] And other alloys acceptable to the Commandant.

(5) *Joints.* All metallic tank joints shall be welded or brazed.

(6) *Fittings.* Nozzles, flanges, or other fittings for pipe connections shall be welded or brazed to the tank. The tank openings in way of pipe connections shall be properly reinforced where necessary. Where fuel level gages are used, the flange to which gage fittings are attached shall be welded or brazed to the tank. No tubular gage glasses or trycocks shall be fitted to the tanks.

(7) *Baffle plates.* All tanks exceeding 30 inches in any horizontal dimension shall be fitted with vertical baffle plates where necessary for strength or for control of excessive surge. In gen-

eral, baffle plates installed at intervals not exceeding 30 inches will be considered as meeting this requirement.

(8) *Baffle plate details.* Baffle plates, where required, shall be of the same material and not less than the minimum thickness required in the tank walls and shall be connected to the tank walls by welding or brazing. Limber holes at the bottom and air holes at the top of all baffles shall be provided.

(b) *Installation.* (1) Gasoline fuel tanks used for propulsion shall be located in water-tight compartments separate from, but adjacent to the engineroom or machinery space. Fuel tanks for auxiliaries shall be located on or above the weather deck outside of the engine housing or compartment and as close to the engine as practicable. All tanks shall be so installed as to provide a free circulation of air around the tanks.

(2) Cylindrical tanks with longitudinal seams shall be arranged horizontally where practicable so that such seams are located as near the top as possible.

(3) Fuel tanks shall be so installed as to permit examination, testing, or removal for cleaning.

(4) Fuel tanks shall be adequately supported and braced to prevent movement. Portable fuel tanks are not permitted.

(5) All fuel tanks shall be electrically bonded to the common ground.

(c) *Testing.* (1) Prior to installation, tanks vented to atmosphere shall be tested to, and must withstand, a pressure of 5 pounds per square inch or 1½ times the maximum head to which they may be subjected in service, whichever is greater. A standpipe of 11½ feet in height attached to the tank may be filled with water to accomplish the 5 pounds per square inch test. Permanent deformation of the tank will not be cause for rejection unless accompanied by leakage.

(2) After installation of the fuel tank on a vessel the complete installation shall be tested in the presence of a marine inspector to a head not less than that to which the tank may be subjected in service. Fuel may be used as a testing medium.

(3) All tanks not vented to atmosphere shall be constructed and tested in accordance with Part 54 of this subchapter.

[CGFR 68-82, 33 FR 18878, Dec. 18, 1968, as amended by CGFR 72-59R, 37 FR 6190, Mar. 25, 1972]

§ 58.50-10 Diesel fuel tanks.

(a) *Construction.* (1) Tanks may be of either cylindrical or rectangular form.

(2) The materials used and the minimum thickness allowed in the construction of independent fuel tanks shall be as indicated in Table 58.50-10(a), except that consideration will be given to other materials which provide equivalent safety as indicated in § 58.50-15.

(3) Tanks with flanged-up top edges, that may trap and hold moisture, shall not be used.

TABLE 58.50-10(a)

Material	A.S.T.M. specification (latest edition)	Thickness in inches and gage numbers [1] vs. tank capacities for—		
		1- through 80-gallon tanks	More than 80- and not more than 150-gallon tanks	Over 150-gallon tanks [2]
Aluminum [5]	B209, Alloy 5086 [6]	0.250 (USSG 3)	0.250 (USSG 3)	0.250 (USSG 3).
Nickel-copper	B127, Hot rolled sheet or plate.	0.037 (USSG 20) [3]	0.050 (USSG 18)	0.107 (USSG 12).
Steel or iron [4]		0.0747 (MfgStd 14)	0.1046 (MfgStd 12)	0.179 (MfgStd 7)

[1] Gages used are U.S. standard "USSG" for nickel-copper and "MfgStd" for steel or iron.

[2] Tanks over 400 gallons shall be designed with a factor of safety of four on the ultimate strength of the material used with design head of not less than 4 feet of liquid above the top of the tank.

[3] Nickel-copper not less than 0.031 inch (USSG 22) may be used for tanks up to 30-gallon capacity.

[4] For diesel tanks the steel or iron shall not be galvanized on the interior.

[5] Anodic to most common metals. Avoid dissimilar metal contact with tank body.

[6] And other alloys acceptable to the Commandant.

(4) Openings for fill and vent pipes must be on the topmost surface of a tank. There must be no openings in the bottom, sides, or ends of a tank except as follows:

(i) The opening for the fuel supply piping is not restricted to the top of the tank.

(ii) An opening fitted with threaded plug or cap may be used on the bottom of the tank for tank cleaning purposes.

(iii) Liquid level gages must penetrate at a point that is more than 2 inches from the bottom of the tank.

(5) All tank joints shall be welded.

(6) Nozzles, flanges, or other fittings for pipe connections shall be welded or brazed to the tank. The tank opening in way of pipe connections shall be properly reinforced where necessary. Where liquid level indicating devices are attached to the tank, they shall be of heat resistant materials adequately protected from mechanical damage and provided at the tank connections with devices which will automatically close in the event of rupture of the gage or gage lines.

(7) All tanks exceeding 30 inches in any horizontal dimension shall be fitted with vertical baffle plates where necessary for strength or for control of excessive surge. In general, baffle plates installed at intervals not exceeding 30 inches will be considered as meeting this requirement.

(8) Baffle plates, where required, shall be of the same material and not less than the minimum thickness required in the tank walls and shall be connected to the tank walls by welding or brazing. Limber holes at the bottom and air holes at the top of all baffle plates shall be provided.

(9) Iron or steel tanks shall not be galvanized on the interior. Galvanizing paint or other suitable coating shall be used to protect the outside of iron and steel tanks.

(b) *Installation.* (1) Tanks containing fuel for emergency lighting units shall be located on an open deck or in an adequately ventilated metal compartment. No tank shall be located in a compartment where the temperature may exceed 150° F.

(2) When cylindrical tanks are installed, longitudinal seams shall be located as near the top of the tank as possible. Fuel tanks shall be located in, or as close as practicable, to the machinery space which is served.

(3) Fuel tanks shall be so installed as to permit examination, testing, or removal for cleaning.

(4) Fuel tanks shall be adequately supported and braced to prevent movement. Portable tanks are not permitted.

(5) All fuel tanks shall be electrically bonded to the common ground.

(c) *Tests.* (1) Prior to installation, tanks vented to the atmosphere shall be tested to and must withstand a pressure of 5 pounds per square inch or 1½ times the maximum head to which they may be subjected in service, whichever is greater. A standpipe of 11½ feet in height attached to the tank may be filled with water to accomplish the 5 pounds per square inch test. Permanent deformation of the tank will not be cause for rejection unless accompanied by leakage.

(2) After installation of the fuel tank on a vessel the complete installation shall be tested in the presence of a marine inspector to a head not less than that to which the tank may be subjected in service. Fuel may be used as a testing medium.

(3) All tanks not vented to atmosphere shall be constructed and tested in accordance with Part 54 of this subchapter.

[CGFR 68-82, 33 FR 18878, Dec. 18, 1968, as amended by CGFR 69-127, 35 FR 9980, June 17, 1970; CGFR 72-59R, 37 FR 6190, Mar. 25, 1972]

§ 58.50-15 Alternate material for construction of independent fuel tanks.

(a) Materials other than those specifically listed in Table 58.50-5(a) and in Table 58.50-10(a) may be used for fuel tank construction only if the tank as constructed meets the testing requirements of Marine Department, Underwriters' Laboratories, Inc. (formerly Yacht Safety Bureau) STD E-3, paragraph E3-3. Testing may be accomplished by any acceptable laboratory, such as the Marine Department, Underwriters' Laboratories, Inc. (formerly Yacht Safety Bureau), or may be done by the fabricator if witnessed by a marine inspector.

[CGFR 68-82, 33 FR 18878, Dec. 18, 1968, as amended by CGFR 69-127, 35 FR 9980, June 17, 1970]

Subpart 58.60—Industrial Systems and Components on Mobile Offshore Drilling Units (MODU)

AUTHORITY: Sec. 2, 87 Stat. 418 (46 U.S.C. 86); sec. 3, 82 Stat. 341, as amended (46 U.S.C. 367); R.S. 4405, as amended (46 U.S.C. 375); sec. 10, 35 Stat. 428 (46 U.S.C. 395); R.S. 4423, as amended (46 U.S.C. 400); R.S. 4429, as amended (46 U.S.C. 407); R.S. 4430, as amended (46 U.S.C. 408); 88 Stat. 423 (46 U.S.C. 411); R.S. 4434, as amended (46 U.S.C. 412); R.S. 4462, as amended (46 U.S.C. 416); sec. 1, 73 Stat. 475 (46 U.S.C. 481); sec. 4, 67 Stat. 462 (43 U.S.C. 1333(d)); sec. 6(b)(1), 80 Stat. 937 (49 U.S.C. 1655(b)(1)); 49 CFR 1.46 (b) and (n)(6).)

SOURCE: CGD 73-251, 43 FR 56801, Dec. 4, 1978, unless otherwise noted.

§ 58.60-1 Applicability.

This subpart applies to the following industrial systems on board a mobile offshore drilling unit (MODU):

(a) Cementing systems.

(b) Circulation systems, including—

(1) Pipes and pumps for mud;

(2) Shale shakers;

(3) Desanders; and

(4) Degassers.

(c) Blow out preventor control systems.

(d) Riser and guideline tensioning systems.

(e) Motion compensation systems.

(f) Bulk material storage and handling systems.

(g) Other pressurized systems designed for the MODU's industrial operations.

§ 58.60-2 Alternatives and substitutions.

(a) The Coast Guard may accept substitutes for fittings, material, apparatus, equipment, arrangements, calculations, and tests required in this Subpart if the substitute provides an equivalent level of safety.

(b) In any case where it is shown to the satisfaction of the Commandant that the use of any particular equipment, apparatus, arrangment, or test is unreasonable or impracticable, the Commandant may permit the use of alternate equipment, apparatus, arrangement, or test to such an extent and upon such condition as will insure, to his satisfaction, a degree of safety consistent with the minimum standards set forth in this subpart.

§ 58.60-3 Pressure vessel.

A pressure vessel that is a component in an industrial system under this subpart must meet § 54.01-16.

§ 58.60-5 Industrial systems: locations.

An industrial system under this subpart must not be in a space that is—

(a) Concealed; or

(b) Inaccessible to industrial personnel.

§ 58.60-7 Industrial systems: piping.

The piping for industrial systems under this subpart must meet ANSI B31.3 (1977), with June 1978 addenda, except that blow out preventor control systems must also meet API RP 53, *Recommended Practice for Blowout Protection Equipment Systems, (1976).*

§ 58.60-9 Industrial systems: design.

Each system under this subpart must be designed and analyzed in accordance with the principles of API RP 14C, *Analysis, Design, Installation and Testing of Basic Surface Safety Systems on Offshore Production Platforms, (1978).*

§ 58.60-11 Analyses, plans, diagrams and specifications: submission.

(a) Each industrial system must be analyzed by a registered professional engineer to certify that the system has been designed in accordance with applicable standards.

(b) The certification must—

(1) Appear on all diagrams and analyses; and

(2) Be submitted under § 50.20-5 of this chapter.

(c) Standards or specifications for non-pressurized, mechanical or structural systems, and components such as derricks, drawworks, and rotary tables which comply with standards or specifications not referenced in this subchapter must be referenced on the plans or in the specifications of the unit.

§ 58.60-13 Inspection.

An industrial system is accepted by the Coast Guard if the inspector finds—

(a) The system meets this subpart;

(b) There are guards, shields, insulation or similar devices for protection of personnel; and

(c) The system is not manifestly unsafe.

PART 59—REPAIRS TO BOILERS, PRESSURE VESSELS AND APPURTENANCES

Subpart 59.01—General Requirements

Sec.
59.01-1 Scope.
59.01-3 Adoption of the ASME Code.
59.01-5 Repairs, replacements, or alterations.

Subpart 59.10—Welding Repairs to Boilers and Pressure Vessels in Service

59.10-1 Scope.
59.10-5 Cracks.
59.10-10 Corroded surfaces.
59.10-15 Rivets and staybolts.
59.10-20 Patches in shells and tube sheets.
59.10-25 Stayed areas.
59.10-30 Seal welding.
59.10-35 Wrapper plates and back heads.

Subpart 59.15—Miscellaneous Boiler Repairs

59.15-1 Furnace repairs.
59.15-5 Stayed furnaces and combustion chambers.
59.15-10 Bagged or blistered shell plates.

Subpart 59.20—Welding Repairs to Castings

59.20-1 Carbon-steel or alloy-steel castings.

AUTHORITY: R.S. 4405, as amended, 4462, as amended, sec. 633, 63 Stat. 545, sec. 6(b)(1), 80 Stat. 938; 46 U.S.C. 375, 416, 14 U.S.C. 633, 49 U.S.C. 1655(b); 49 CFR 1.4 (a)(2), (f). R.S. 4417, as amended, 4417a, as amended, 4418, as amended, 4426–4431, as amended, 4433, as amended, 4434, as amended, 4488, as amended, 4491, as amended, sec. 14, 29 Stat. 690, as amended, sec. 10, 35 Stat. 428, as amended, 41 Stat. 305, as amended, secs. 1, 2, 49 Stat. 1544, 1545, as amended, sec. 17, 54 Stat. 166, as amended, sec. 3, 54 Stat. 347, as amended, sec. 3, 70 Stat. 152, sec. 3, 68 Stat. 675; 46 U.S.C. 391, 391a, 392, 404-409, 411, 412, 481, 489, 366, 395, 363, 367, 526p, 1333, 390b, 50 U.S.C. 198; E.O. 11239, July 31, 1965, 30 FR 9671, 3 CFR, 1965 Supp., unless otherwise noted.

SOURCE: CGFR 68-82, 33 FR 18887, Dec. 18, 1968, unless otherwise noted.

Subpart 59.01—General Requirements

§ 59.01-1 Scope.

The regulations in this part apply to the repairs of all boilers, appurtenances and pressure vessels subject to inspection by the Coast Guard.

§ 59.01-3 Adoption of the ASME Code.

(a) *General.* The portions of the ASME (American Society of Mechanical Engineers) Code listed in this Part for various subjects are adopted and shall be the governing requirements except as limited, modified, or replaced by specific requirements in this subchapter.

(Sec. 552, 80 Stat. 383, as amended; 5 U.S.C. 552)

§ 59.01-5 Repairs, replacements, or alterations.

(a) No repairs, replacements, or alterations, except emergency repairs, shall be made to boilers, pressure vessels, their mountings or internal fittings, safety valves, piping systems, or pressure appliances without prior approval by the Officer in Charge, Marine Inspection.

(b) Emergency repairs, replacements, or alterations shall be reported as soon as practicable to the Officer in Charge, Marine Inspection, at or nearest the first port where the vessel may call after such repairs are made.

(c) Plan approval shall be obtained from the Officer in Charge, Marine Inspection, for all alterations to systems in service as listed in § 56.01-10(c) of this subchapter and those items listed in paragraph (a) of this section.

(d) Repairs, replacements, or alterations to machinery or items not covered by other sections of this part shall be made in a manner consistent with the part of this subchapter containing the construction standards for the item in question.

(e) Where applicable, manufacturers' instruction books, manuals, etc., and the Mechanical Injury Section, paragraphs C4.401 through C4.427 of section VII of the ASME Code, shall be used for guidance.

Subpart 59.10—Welding Repairs to Boilers and Pressure Vessels in Service

§ 59.10–1 Scope.

(a) Repairs to boilers or pressure vessels in service may be performed by welding provided the welding meets the applicable requirements of Part 57 of this subchapter.

(b) No repairs by welding shall be made except temporary emergency repairs without prior approval of the Officer in Charge, Marine Inspection Emergency repairs shall be replaced with permanent repairs meeting the requirements of this subchapter when the vessel returns to a port in which an Officer in Charge, Marine Inspection, is located except in the case of minor repairs which in the opinion of the Officer in Charge, Marine Inspection, do not materially affect the safety of the boiler or pressure vessel.

(c) Repair welding of power boilers, not meeting the requirements of Subpart 52.05 of this subchapter, is prohibited unless the stress is carried by such other type(s) of construction complying with the requirements of this subchapter, and where the adequacy of the boiler design is not solely dependent upon the strength of the welds.

(d) Only welded repairs as specified in this subchapter are permitted on boilers and pressure vessels. The welding repairs allowed by this subpart apply only to boilers and pressure vessels fabricated of carbon steel. Welding repairs to boilers and pressure vessels fabricated of alloy steel will be given special consideration by the Commandant. Such other method of repairs by means of welding not covered in this subchapter shall be referred to the Commandant and may be authorized by him, if in his opinion, it meets the intent of this subchapter.

§ 59.10–5 Cracks.

(a) Cracks extending from the calking edge of plates to the rivet holes of circumferential joints may be welded provided the cracks are veed out so that complete penetration of the weld metal is secured.

(b) Circumferential cracks from rivet hole to rivet hole in girth joints may be welded provided there are not more than three consecutive cracked ligaments nor more than a total of six cracked ligaments in any one girth joint.

(c) Cracks in staybolted plates may be welded provided they are located entirely within staybolted areas and the total length of any crack or series of consecutive cracks does not exceed two staybolt pitches.

(d) Cracks in plain, circular or Adamson ring or similar type furnaces may be welded provided any one crack does not exceed 12 inches in length and after completion the weld is stress-relieved. Cracks in corrugated furnaces may be repaired by welding provided any one crack does not exceed 20 inches in length.

(e) Fire cracks may be welded at riveted door openings extending from the edge of the plate, but not more than 2 inches beyond the centerline of the rivet holes.

(f) Cracks may be welded between tube holes in the shell of water tube boiler drums, provided there are not more than two cracks in any one row in any direction, nor more than a total of four cracks in a drum, and further provided the welding meets the requirements of this subchapter for Class I welded pressure vessels and is approved by the Commandant.

(g) Cracks that occur in superheater manifolds, water wallheaders, water drums, sectional headers, and other appurtenances including steam manifolds of water tube boilers may be repaired in accordance with paragraph (h) of this section if the repair is approved.

(h) All cracks permitted to be repaired under this subpart shall be excavated to sound metal by grinding, flame or arc gouging or chipping out the defective metal to form a clean welding groove. The first two methods of excavation are preferable. Either a V groove or U groove wherein complete penetration of the weld metal is secured may be used. After excavation is completed and prior to welding, the excavated area shall be examined by magnetic particle, dye penetrant, or other acceptable test method. When the reverse side of the weld is accessible the root of the weld shall be chipped or ground out to insure a clean surface of the originally deposited metal and the resultant groove welded to obtain a sound weld having complete penetration. When the weld cannot be back chipped because the reverse side is inaccessible, a backing strip or other approved means of assuring full penetration shall be employed.

(i) During welding of cracks a preheat shall be maintained by controlled temperatures. The degree of preheat shall be determined by the rules listed in accordance with the materials P-number groupings of PW-38, section I, Appendix R, section VIII and Table Q. 11.1, section IX of the ASME Code. For thicknesses exceeding three-fourths inch, suitable U grooves should be employed. A welding sequence shall be used so as to equalize welding stresses.

(j) Postweld heat treatment of repaired cracks shall be performed in accordance with the rules specified in PW-39, section I and UW-40, section VIII of the ASME Code for boilers and pressure vessels respectively.

(k) Welded repairs of cracks shall be nondestructively tested in accordance with the rules specified in PW-40, section I, and UW-51, section VIII of the ASME Code for boilers and pressure vessels respectively.

(*l*) After cracks originating in tube or rivet holes are repaired by welding, the holes shall be properly reamed and the weld reinforcing ground flush with the plate in way of rivet heads.

(m) Flat tube sheets in fire-tube boilers which have corroded or where cracks exist in the ligaments may be repaired by welding.

(n) Welding repairs to drums of power boilers, except as otherwise permitted in this subpart, are prohibited.

§ 59.10-10 Corroded surfaces.

(a) Corroded surfaces in the calking edges of circumferential seams may be built up by welding to the original thickness under the following conditions:

(1) The thickness of the original metal to be built up between the rivet holes and the calking edge shall not be less than one-fourth of the diameter of the rivet hole, and the portion of the calking edge to be thus reinforced shall not exceed 30 inches in length in a circumferential direction.

(2) In all repairs to circumferential seams by welding, the rivets shall be removed over the portions to be welded for a distance of at least 6 inches beyond the repaired portion.

(3) After repairs are made the rivet holes shall be reamed before the rivets are redriven.

(b) It is not permissible to build up or reinforce a grooved or corroded area of unstayed internal surfaces by means of welding, except that widely scattered pit holes may be built up by welding.

(c) Where external corrosion has reduced the thickness of flat plates around hand holes to an extent of not more than 40 percent of the original thickness and for a distance not exceeding 2 inches from the edge of the hole, the plate may be built up by welding.

(d) Where stayed sheets have corroded to a depth not exceeding 40 percent of their original thickness, they may be reinforced or built up by welding. Where the staybolts are fitted with riveted heads, the staybolts in the reinforced area shall be renewed in accordance with the provisions of § 52.20-15 of this subchapter, but where the staybolts are fitted with nuts, the nuts may be removed and after reinforcing has been applied, collars may be welded around the staybolts in lieu of the nuts. Such reinforced areas shall not exceed 400 square inches nor more than 30 inches in one direction. Two such areas in any one plate may be reinforced: *Provided*, that the distance between the reinforced surfaces is not less than 30 inches.

(e) When the corroded portion of a staybolted surface exceeds 400 square inches, it is permissible to make repairs by cutting out the defective portion and replacing it with a new plate, the edges of the new plate to be welded in position. In such cases, new staybolts shall be fitted in accordance with the requirements of § 52.20-15 of this subchapter and where welding is performed through a line of staybolts, welded collars as required by Figure 52.01-3 of this subchapter shall be used to attach the staybolts.

(f) Eroded seams of welded pressure vessels may be repaired by rewelding the wasted portion. The wasted section of the seam shall be excavated sufficiently by grinding, flame or arc gouging or chipping to ensure proper weld penetration. Rewelded seams shall be nondestructively tested in accordance with section VIII, ASME Code.

§ 59.10-15 Rivets and staybolts.

(a) It is not permitted to reinforce or build up by welding the heads of rivets or staybolts that have deteriorated. Such rivets or staybolts shall be replaced. The seal welding of rivet heads to secure tightness is prohibited.

(b) Where leaks develop around staybolts which are otherwise in good condition, the nuts may be replaced with a beveled collar formed around the end of the stay by means of welding. In such cases, the depth of collar measured on the stay and the width measured on the plate, shall be equal to one-half the diameter of the staybolt.

§ 59.10-20 Patches in shells and tube sheets.

(a) Unreinforced openings in the shells or drums of boilers or pressure vessels, the diameter of which does not exceed the maximum diameter of an unreinforced opening in accordance with § 52.01-100 of this subchapter may be closed by the use of a patch or plate inside the drum or shell and sealed against leakage by welding. Such plates shall have a diameter of at least 2 inches larger than the diameter of the hole and shall have a thickness equal to the thickness of the plate to which it is attached. It is not permissible to insert such patches in the shell or head flush with the surrounding plate unless the requirements of this subchapter for Class I welded pressure vessels are met.

(b) Portions of tube sheets which have deteriorated may be renewed by replacing the wasted portion with a new section. The ligaments between the tube holes may be joined by means of welding and staytubes. Other acceptable means of lowering the stress on the repaired section may be used if in the judgment of the Officer in Charge, Marine Inspection, it is necessary.

§ 59.10-25 Stayed areas.

Welding repairs are permitted in staybolted areas or areas adequately stayed by other means so that should failure of the welds occur the stress will be carried by the stays. The welds shall be located entirely within staybolted areas and shall not pass through the outer row of stays.

§ 59.10-30 Seal welding.

Where leaks occur in riveted joints or connections, they shall be carefully investigated to determine the cause. Such leaks may be made tight by seal welding the edge, if, in the opinion of the Officer in Charge, Marine Inspection, this will make a satisfactory repair.

§ 59.10-35 Wrapper plates and back heads.

Wrapper plates and back heads may be renewed in whole or repaired as follows:

(a) Wrapper plates or backs heads shall be cut between two rows of staybolts or on a line of staybolts where the thickness is approximately the same as the original construction. If welding is employed on a line of staybolts, the staybolts shall be fitted with a welded collar as required by Figure 52.01-3 of this subchapter.

(b) The edges of wrapper plates riveted to tube sheets and back heads shall be removed by cutting out the rivets.

(c) The edges of existing plates and new plates shall be beveled by chipping, flame cutting or grinding so as to form a suitable groove whereby complete penetration of the weld metal will be obtained. The edge preparation and preheat shall comply with the requirements of § 59.10-5(h).

(d) The edges of the new plate shall be buttwelded and the plate shall be riveted to the flanges of the sube sheet and back heads and the staybolts renewed.

(e) Sections of wrapper plates of combustion chambers outside of stayed areas may be repaired by welding provided the welded joints are stress-relieved by means of controlled heat and the joints are nondestructively tested.

Subpart 59.15—Miscellaneous Boiler Repairs

§ 59.15–1 Furnace repairs.

(a) Where corrugated or plain furnances or flues are distorted by 1½ inches or more, they shall be repaired by either of the following methods:

(1) The furnace shall be forced back to a true circular shape, and the Officer in Charge, Marine Inspection, may require strongbacks or other acceptable means of support to hold the furnace from future collapse, if in his opinion such support is necessary; or,

(2) The furnace shall be adequately stayed as found necessary in the judgment of the Officer in Charge, Marine Inspection.

(b) Distortion means the difference between any single measured diameter of the furnace and the diameter of a true circle at the same location. The diameter of the true circle may be taken as the original furnace diameter or may be determined by a means acceptable to the Officer in Charge, Marine Inspection.

(c) Where the distortion does not exceed 1½ inches it will not be necessary to force the furnace back to a true circle if the allowable pressure is reduced in the ratio of 1½ percent for each one-tenth of an inch of distortion. However, if the maximum distortion does not exceed 1 inch and the length of the distorted area is not more than three corrugations, or, if the maximum distortion does not exceed three-fourths inch for a length greater than three corrugations of distorted area, the repairs or reduction in pressure will not be required unless considered necessary by the marine inspector.

(d) When it becomes necessary to rivet a patch to a furnace or other part of the heating surface, the riveted patch shall be placed on the waterside of the plate in order not to form a pocket in which sediment may collect.

(e) Furnace crowns which have become distorted, not in excess of the limitations provided in paragraph (c) of this section, may be repaired by pumping back the distorted section to as nearly a true circle as possible and reinforcing the same by means of a ring, arc- or gas-welded to the distorted corrugation as shown in Figure 59.15–1, the welding to be done by welders and welding processors qualified in accordance with Part 57 of this subchapter using acceptable welding electrodes in accordance with § 5702–4 of this subchapter.

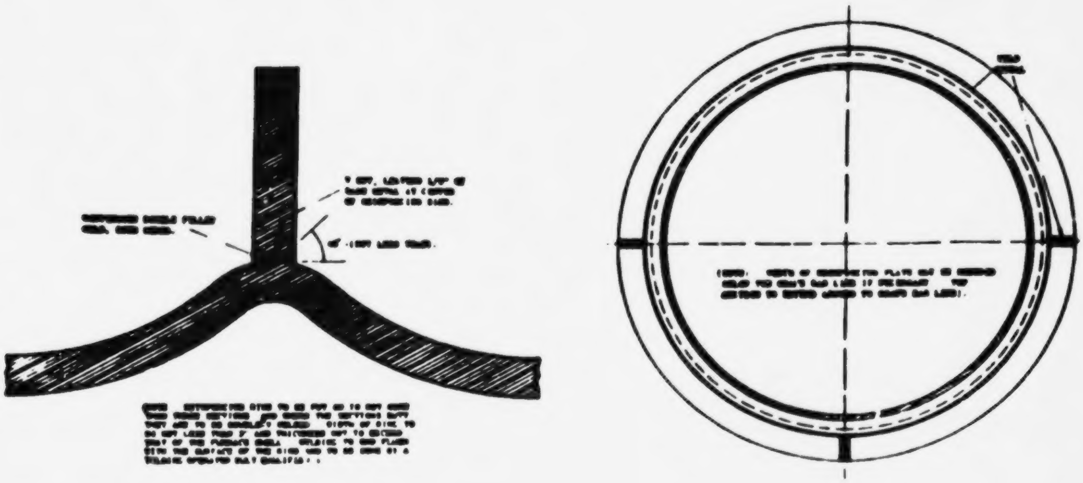

FIGURE 59.15-1.—Approved method of reinforcing furnaces by means of arc or gas welding.

§ 59.15-5 Stayed furnaces and combustion chambers.

(a) Where the plate forming the walls of stayed furnaces or combustion chambers become bulged between staybolts, repairs may be made by inserting an additional staybolt in the center of such space supported by the four staybolts.

(b) Where it is desired to rivet a patch to the wall of a stayed furnace or combustion chamber, the defective portion of the plate shall be cut away until solid material is reached, the patch shall be riveted on the waterside, and the staybolts renewed, and extended through the new plate.

§ 59.15-10 Bagged or blistered shell plates.

(a) When the shell plates of cylindrical boilers which are exposed to the radiant heat of the fire become bagged or blistered, it shall be the duty of the chief engineer in charge of the vessel to notify the Officer in Charge, Marine Inspection, for examination before raising steam on the boiler.

(b) Where the shell plate is bagged due to overheating, the Officer in Charge, Marine Inspection, may, if in his judgment it is practicable, permit the same to be driven back to its original position.

(c) Where the shell plate has blistered, bagged, or bulged to such an extent that there is an appreciable thinning of the plate, the Officer in Charge, Marine Inspection, shall require the defective portion to be cut away and the shell repaired by fitting a patch of steel plate conforming to the requirements of § 52.01-90 of this subchapter in place of the defective portion. Care shall be taken that the riveting schedule of the patch is so arranged as to give the plate sufficient strength to withstand the stress placed on it in service.

Subpart 59.20—Welding Repairs to Castings.

§ 59.20-1 Carbon-steel or alloy-steel castings.

Defects in carbon-steel or alloy-steel castings may be repaired by welding. The repairs shall be performed in accordance with the material specification to which the casting was originally supplied.

PART 60—[RESERVED]

PART 61—PERIODIC TESTS AND INSPECTIONS

Subpart 61.01—General

Sec.
61.01-1 Scope.

Subpart 61.05—Tests and Inspections of Boilers

61.05-1 Scope.
61.05-5 Preparation of boilers for inspection and test.
61.05-10 Boilers in service.
61.05-15 Boiler mountings and attachments.
61.05-20 Safety valves.

Subpart 61.10—Tests and Inspections of Pressure Vessels

61.10-1 Scope.
61.10-5 Periodic inspection.

Subpart 61.15—Periodic Tests of Piping Systems

61.15-1 Scope.
61.15-5 Steam piping.
61.15-10 Liquefied petroleum gas piping for heating and cooking.
61.15-15 Other piping.

Subpart 61.20—Periodic Tests of Machinery and Equipment

61.20-1 Steering gear.
61.20-3 Main and auxiliary machinery and associated equipment, including fluid control systems.
61.20-5 Drydock examination.
61.20-15 Tailshaft survey.
61.20-17 Examination intervals.
61.20-18 Examination details.
61.20-21 Extension of examination interval.
61.20-23 Tailshaft clearance; bearing weardown.

Subpart 61.25—Periodic Tests and Inspections of Nuclear Reactor Power Plants

61.25-1 General standards and requirements.
61.25-5 Special preparations.

Authority: R.S. 4405, as amended, 4462, as amended, secs. 2, 633, 63 Stat. 496, 545, sec. 6(b)(1), 80 Stat. 938; 46 U.S.C. 375, 416, 14 U.S.C. 2, 633, 49 U.S.C. 1655(b); 49 CFR 1.4(a)(2), (f). R.S. 4399, as amended, 4400, as amended, 4417, as amended, 4417a, as amended, 4418, as amended, 4421, as amended, 4426-4431, as amended, 4433, as amended, 4434, as amended, 4453, as amended, 4472, as amended, 4488, as amended, 4491, as amended, sec. 2, 23 Stat. 118, as amended, sec. 14, 29 Stat. 690, as amended, sec. 10, 35 Stat. 428, as amended, 41 Stat. 305, as amended, secs. 1, 2, 49 Stat. 1544, 1545, as amended, sec. 17, 54 Stat. 166, as amended, sec. 3, 54 Stat. 347, as amended, sec. 3, 70 Stat. 152, sec. 3, 68 Stat. 675; 46 U.S.C. 361, 362, 391a, 392, 399, 404-409, 411, 412, 435, 170, 481, 489, 2, 366, 395, 363, 367, 526p, 1333, 390b, 50 U.S.C. 198; E.O. 11239, July 31, 1965, 30 FR 9671, 3 CFR, 1965 Supp., unless otherwise noted.

Source: CGFR 68-82, 33 FR 18890, Dec. 18, 1968, unless otherwise noted.

Subpart 61.01—General

§ 61.01-1 Scope.

(a) Periodic tests and inspection shall be made of the main and auxiliary machinery, boilers, nuclear pressure vessels, and other equipment as prescribed in this part.

(b) The inspections and tests shall insure that the equipment and associated structure are in satisfactory operating conditions and fit for the service for which they are intended.

Subpart 61.05—Tests and Inspections of Boilers

§ 61.05-1 Scope.

(a) The term "boiler" as used in this part shall include power boilers subject to Part 52 and heating boilers subject to Part 53 of this subchapter, including thermal fluid heaters.

§ 61.05-5 Preparation of boilers for inspection and test.

(a) It shall be the responsibility of the chief engineer to prepare the boilers for inspection.

(b) For internal inspection, manhole and handhold plates, and washout plugs shall be removed as required by the marine inspector and the furnace and combustion chambers shall be thoroughly cooled and cleaned. Portable obstructions shall be removed as necessary for proper access.

(c) In preparing the boilers for the hydrostatic test, they shall be filled with water at not less than 70° F. and not more than 160° F. for watertube boilers, and not more than 100° F. for firetube boilers. The safety valves shall be secured by means of gags or clamps.

§ 61.05–10 Boilers in service.

(a) Main boilers, including superheaters, reheaters, economizers, auxiliary boilers, low pressure heating boilers, unfired steam boilers, and thermal fluid heaters shall be examined by a marine inspector at the inspection for certification and oftener if necessary, to determine that the complete unit is in a safe and satisfactory condition. Where hydrostatic tests are required, an inspection shall be made of all accessible parts while under pressure.

(b) Hydrostatic tests shall be applied to all boilers as provided in Table 61.05–10. The owner, master, or person in charge of the vessel shall give an advance notice to the appropriate Officer in Charge, Marine Inspection, so that a marine inspector may be scheduled to witness the tests and to make the required inspection.

(c) Firetube boilers which cannot be entered or which cannot be satisfactorily examined internally, all boilers of lap seam construction and all boilers to which extensive repairs have been made or the strength of which the marine inspector has any reason to question, shall be subjected to a hydrostatic test of 1½ times the maximum allowable working pressure. All other boilers shall be subjected to a hydrostatic test of 1¼ times the maximum allowable working pressure.

(d) In applying hydrostatic pressure to boilers, arrangements shall be made to prevent main and auxiliary stop valves from being simultaneously subjected to the hydrostatic pressure on one side and steam pressure on the other side.

(e) If the marine inspector has reason to believe that the boiler has deteriorated to any appreciable extent under the bottom where it rests on saddles or foundations, he shall cause the boiler to be lifted to such position that it can be thoroughly examined, provided the examination cannot be made otherwise.

(f) The marine inspector may require any boiler to be drilled or gaged to determine actual thickness any time its safety is in doubt. At the first inspection for certification after a firetube or flue boiler has been installed for 10 years, it shall be gaged to determine the extent of deterioration. Thickness will be measured at or near the waterline, at the bottom and at such other places deemed necessary by the marine inspector. Examination may be by drilling or a nondestructive means acceptable to the marine inspector. Prior to the use of a nondestructive method of examination, the user shall demonstrate to the marine inspector that results having an accuracy within plus or minus 5 percent are consistently obtainable when using specimens similar to those to be examined on the boiler.

(g) If the thickness is found to be less than the original thickness upon which the maximum allowable working pressure was based, it shall be recalculated. The thickness of the thinnest measured portion shall be used in this calculation. Either the design formulas given in this subchapter or the ones in effect when the boiler was contracted for or built may normally be used in this recalculation. In no case will an increase in the pressure allowed be made.

TABLE 61.05–10—HYDROSTATIC TESTS

Boiler	Passenger vessels	Cargo, tank and miscellaneous vessels
Firetube	Annual	Annual.
Watertube	Annual	Quadrennial.
Fired thermal fluid heaters.[1]	Annual	Quadrennial.

[1] The fluid used in the thermal fluid heater may be used for the liquid medium for the hydrostatic test.

§ 61.05–15 Boiler mountings and attachments.

(a) All valves shall be opened up and examined by the marine inspector after each 4 years of service.

(b) All boiler mounting studs or bolts shall be examined after each 8 years of service. Boiler mounting studs or bolts shall be removed for examination on those mountings that are required to be removed.

(c)(1) Boiler mountings shall be removed from the boiler for examination after each 8 years of service where any of the following conditions exist:

(i) Boilers having boiler mountings attached directly to the boiler plating by screwed studs and nuts.

(ii) Boilers having boiler mountings attached to a reinforcing pad by screwed studs and nuts; and this pad is attached directly to the boiler plating.

(iii) Boilers having boiler mountings so installed that a satisfactory examination of these mountings or of their attaching studs cannot be made by removing the bonnet and internal parts of the valve.

(2) Where boiler mountings or valves are attached to boiler nozzles and a satisfactory internal examination of these mountings or valves and their attaching studs, bolts, or other means of attachment, can be performed by opening up the valves, such mountings or valves need not be removed from the boiler unless in the opinion of the Officer in Charge, Marine Inspection, such action is necessary.

(d) The Officer in Charge, Marine Inspection, may require the examinations prescribed in this section to be made at more frequent intervals, if in his opinion such action is necessary to be assured of the safety of the boiler and its attachments.

(e) Water columns, gage glasses, and gage cocks shall be examined to determine that they are in satisfactory working order.

(f) Stream gages on boilers or main steam lines shall be examined and checked for accuracy.

(g) The marine inspector shall examine the fusible plugs.

[CGFR 68-82, 33 FR 18890, Dec. 18, 1968, as amended by CGFR 69-127, 35 FR 9980, June 17, 1970]

§ 61.05-20 Safety valves.

(a) At each inspection for certification all boiler drum, superheater, and reheater safety valves are to be tested and resealed in the presence of the marine inspector.

Subpart 61.10—Tests and Inspections of Pressure Vessels

§ 61.10-1 Scope.

(a) All pressure vessels aboard ships, mobile offshore drilling units, and barges are subject to periodic inspection.

(b) For the requirements for nuclear powerplant components, see Subpart 61.25.

(Sec. 2, 87 Stat. 418 (46 U.S.C. 86); sec. 3, 82 Stat. 341, as amended (46 U.S.C. 367); R.S. 4405, as amended (46 U.S.C. 375); sec. 10, 35 Stat. 428 (46 U.S.C. 395); R.S. 4423, as amended (46 U.S.C. 400); R.S. 4429, as amended (46 U.S.C. 407); R.S. 4430, as amended (46 U.S.C. 408); 88 Stat. 423 (46 U.S.C. 411); R.S. 4434, as amended (46 U.S.C. 412); R.S. 4462, as amended (46 U.S.C. 416); sec. 1, 73 Stat. 475 (46 U.S.C. 481); sec. 4, 67 Stat. 462 (43 U.S.C. 1333(d)); sec. 6(b)(1), 80 Stat. 937 (49 U.S.C. 1655(b)(1)); 49 CFR 1.46 (b) and (n)(6))

[CGD 68-82, 33 FR 18890, Dec. 18, 1968, as amended by CGD 73-251, 43 FR 56801, Dec. 4, 1978]

§ 61.10-5 Periodic inspection.

(a) *Basic requirement.* At each initial and subsequent inspection for certification the marine inspector shall examine or test all pressure vessels to the extent necessary to determine that their condition is satisfactory and that they are fit for the service intended.

(b) *Internal and external examination and tests.* Pressure vessels that required initial shop inspection and pressure vessels that are accepted under § 54.01-16 which are fitted with manholes or other inspection openings, so they can be satisfactorily examined internally, must be opened biennially at the regular inspection for certification and thoroughly examined internally and externally. Such pressure vessels are not required to be hydrostatically tested unless defects are found, which in the marine inspector's opinion, may impair the safety of the pressure vessel. Where such defects are found, a hydrostatic test must be applied at a pressure equal to 1¼ times the maximum allowable working pressure.

(c) *Special purpose vessels.* Tubular heat exchangers, hydraulic accumulators, and those pressure vessels used in refrigeration service shall be examined under operating conditions at the regular inspection for certification.

(d) *Hydrostatic pressure tests.* All pressure vessels, other than those exempt by the provisions of this section, shall be subjected to a hydrostatic test 1¼ times the maximum allowable working pressure biennially at the regular inspection for certification.

(e) *Exemptions from hydrostatic tests.* The following pressure vessels will not normally be subjected to a hydrostatic test:

(1) Tubular heat exchangers.

(2) Pressure vessels used in refrigeration service.

(3) Hydraulic accumulators.

(4) Pressure vessels which have been satisfactorily examined internally by a marine inspector and in which no defects have been found which impair the safety of the pressure vessel.

(5) Pressure vessels which were initially pneumatically tested in accordance with Part 54 of this subchapter.

(6) Pressure vessels exempted from initial shop inspection under § 54.01-15 of this subchapter.

(f) *Compressed gas or hazardous liquid pressure vessel tests.* Cargo tanks of pressure vessel configuration containing liquefied, compressed gases or hazardous liquids shall be inspected and tested as required by the applicable regulations published in Subchapter D, Subchapter I, or Subchapter N of this chapter.

(g) *Bulk storage tanks.* Bulk storage tanks containing refrigerated liquefied CO_2 gas for use on board vessels as a fire extinguishing agent shall be subjected to a hydrostatic test at the inspection for certification on the eighth year of the installation and at 8-year intervals thereafter. The hydrostatic test pressure shall be 1½ times the allowable pressure. At the conclusion of the hydrostatic test, the tank shall be drained and an internal examination made. Portions of the jacket and lagging on the underside of the tank shall be removed at the time of the hydrostatic test as deemed necessary by the marine inspector so as to determine the external condition of the tank.

(h) *Pneumatic tests.* (1) Pressure vessels which have been pneumatically tested during shop inspection must be thoroughly examined internally and externally biennially at the regular inspection for certification except in those instances where the inspection interval is prescribed otherwise, by the specific regulations applicable to the product carried, in Subchapter D (Tank Vessels), Subchapter I (Cargo and Miscellaneous Vessels), Subchapter IA (Mobile Offshore Drilling Units), or Subchapter N (Dangerous Cargoes) of this Chapter. For those tanks whose design precludes a thorough internal or external examination, the thickness must be determined by a nondestructive method acceptable to the Officer in Charge, Marine Inspection.

(2) Such pressure vessels in service are not required to be pneumatically tested unless repairs have been made to them, or unless defects are found which in the opinion of the marine inspector may impair the safety of the pressure vessel. If required, the pneumatic test shall be conducted in accordance with Part 54 of this subchapter.

(i) *Safety valves on pressure vessels.* The setting of safety valves or relief valves on all pressure vessels except cargo tanks, shall be checked by the marine inspector at each regular inspection for certification. Cargo tank safety or relief valves shall be checked at the interval required in Subchapter D (Tank Vessels) or I (Cargo and Miscellaneous Vessels) of this chapter, as appropriate.

(Sec. 2, 87 Stat. 418 (46 U.S.C. 86); sec. 3, 82 Stat. 341, as amended (46 U.S.C. 367); R.S. 4405, as amended (46 U.S.C. 375); sec. 10, 35 Stat. 428 (46 U.S.C. 395); R.S. 4423, as amended (46 U.S.C. 400); R.S. 4429, as amended (46 U.S.C. 407); R.S. 4430, as amended (46 U.S.C. 408); 88 Stat. 423 (46 U.S.C. 411); R.S. 4434, as amended (46 U.S.C. 412); R.S. 4462, as amended (46 U.S.C. 416); sec. 1, 73 Stat. 475 (46 U.S.C. 481); sec. 4, 67 Stat. 462 (43 U.S.C. 1333(d)); sec. 6(b)(1), 80 Stat. 937 (49 U.S.C. 1655(b)(1)); 49 CFR 1.46 (b) and (n)(6))

[CGFR 68-82, 33 FR 18890, Dec. 18, 1968, as amended by CGFR 69-127, 35 FR 9980, June 17, 1970; CGD 73-251, 43 FR 56801, Dec. 4, 1978]

Subpart 61.15—Periodic Tests of Piping Systems

§ 61.15-1 Scope.

(a) In conducting hydrostatic tests on piping, the required test pressure shall be maintained for a sufficient length of time to permit an inspection to be made of all joints and connections. The setting of the relief valve or safety valve will be considered as establishing the maximum allowable working pressure of the system.

(b) For requirements for nuclear power plant components, see Subpart 61.25.

§ 61.15-5 Steam piping.

(a) Main steam piping shall be subjected to a hydrostatic test equal to 1¼ times the maximum allowable working pressure at the same periods prescribed for boilers in § 61.05-10. The hydrostatic test shall be applied from the boiler drum to the throttle valve. If the covering of the piping is not removed, the test pressure shall be maintained on the piping for a period of ten minutes. If any evidence of moisture or leakage is detected, the covering shall be removed and the piping thoroughly examined.

(b) All steam piping subject to main boiler pressure shall be subjected to a hydrostatic test pressure of 1¼ times the maximum allowable working pressure of the boiler after each four years of service except as otherwise provided for in paragraph (a) of this section. If the covering of the piping is not removed, the test pressure shall be maintained on the piping for a period of ten minutes. If any evidence of moisture or leakage is detected, the covering shall be removed and the piping thoroughly examined. A pipe with a nominal size of 3 inches or less is not required to be hydrostatically tested.

(c) The setting of safety and relief valves installed in piping systems shall be checked by the marine inspector at each inspection for certification.

[CGFR 68-82, 33 FR 18890, Dec. 18, 1968, as amended by CGD 73-248, 39 FR 30839, Aug. 26, 1974]

§ 61.15-10 Liquefied petroleum gas piping for heating and cooking.

(a) Leak tests as described in paragraph (b) of this section shall be conducted at least once each month and at each inspection for certification. The tests required at monthly intervals shall be conducted by a licensed officer of the vessel or qualified personnel acceptable to the Officer in Charge, Marine Inspection. The owner, master, or person in charge of the vessel shall keep records of such tests showing the dates when performed and the name(s) of the person(s) and/or company conducting the tests. Such records shall be made available to the marine inspector upon request and shall be kept for the period of validity of the vessel's current certificate of inspection. Where practicable, these records should be kept in or with the vessel's logbook.

(b) Test system for leakage in accordance with the following procedure: With appliance valve closed, the master shutoff valve on the appliance open, and with one cylinder valve open, not pressure in gage. Close cylinder valve. The pressure should remain constant for at least 10 minutes. If the pressure drops, locate leakage by application of liquid detergent or soapy water solution at all connections. Never use flame to check for leaks. Repeat test for each cylinder in a multicylinder system.

§ 61.15-15 Other piping.

(a) All other piping systems shall be examined under working conditions as required by the marine inspector.

Subpart 61.20—Periodic Tests of Machinery and Equipment

§ 61.20-1 Steering gear.

(a) Steering gear shall be tested and inspected by the marine inspector at each inspection for certification and oftener if necessary.

(b) All devices employed in the change-over from automatic to manual operation shall be examined and tested.

§ 61.20-3 Main and auxiliary machinery and associated equipment, including fluid control systems.

(a) At each inspection for certification the marine inspector shall conduct such tests and inspections of the main propulsion and auxiliary machinery and of its associated equipment, including the fluid control systems, as he feels necessary to check safe operation.

(b) Remote control for the means of stopping machinery driving forced and induced draft fans, fuel oil transfer pumps, fuel oil unit pumps, and fans in the ventilation systems serving machinery and cargo spaces shall be tested at each regular inspection for certification.

§ 61.20-5 Drydock examination.

(a) When any vessel is drydocked, examination shall be made of the propeller, stern bushing, sea connection, and fastenings if deemed necessary by the marine inspector.

(b) Sea chests, sea valves, sea strainers, and bilge injection valves shall be opened up for examination at the time of drydocking if deemed necessary by a marine inspector.

§ 61.20-15 Tailshaft examination.

The rules in §§ 61.20-15 through 61.20-23 apply only to vessels in ocean and coastwise service. Each examination, inspection and test prescribed by these sections must be conducted in the presence of a marine inspector.

(46 U.S.C. 375, 390b, 391a, 416; 49 U.S.C. 1655(b)(1); 49 CFR 1.46(b))

[CGD 78-153, 45 FR 52388, Aug. 7, 1980]

§ 61.20-17 Examination intervals.

(a) Except as provided in paragraphs (b) and (c) of this section, each tailshaft on a vessel must be examined at least once within two years.

(b) Tailshafts fabricated of materials resistant to corrosion by sea water, or fitted with a continuous liner or a sealing gland which prevents sea water from contacting the shaft must be examined at the following intervals:

(1) A tailshaft on a vessel with a single tailshaft must be examined at least once within three years, except that a tailshaft with a taper, keyway, and propeller designed in accordance with American Bureau of Shipping standards to reduce stress concentrations must be examined at least once within four years.

(2) Each tailshaft on a vessel with multiple tailshafts must be examined at least once within four years.

(c) A tailshaft on a mobile offshore drilling unit is not subject to the examination intervals prescribed in paragraphs (a) and (b) of this section if it is:

(1) Examined during each regularly scheduled drydocking; or

(2) Regularly examined in a manner acceptable to the Commandant.

(46 U.S.C. 375, 390b, 391a, 416; 49 U.S.C. 1655(b)(1); 49 CFR 1.46(b))

[CGD 78-153, 45 FR 52388, Aug. 7, 1980]

§ 61.20-18 Examination details.

(a) Except as provided in paragraphs (b) and (c) of this section, each tailshaft on a vessel must be drawn and visually inspected at each examination.

(b) Tailshafts with a taper, keyway, and propeller designed in accordance with American Bureau of Shipping standards to reduce stress concentration must be examined as follows:

(1) Each tailshaft with water lubricated bearings must be drawn for examination. At each examination, in addition to a visual inspection of the entire shaft, the forward ⅓ of the shaft's taper section must be nondestructively tested.

(2) Each tailshaft with oil lubricated bearings must be examined as prescribed in paragraph (b)(1) of this section or as follows:

(i) The shaft must be shifted aft, as directed by the attending marine inspector, to expose the after end of its bearing contact area;

(ii) The exposed bearing contact area and the forward ⅓ of the shafts' taper section must be nondestructively tested and

(iii) The shaft's bearing clearance, seals, and lubricating system must be inspected.

(c) Tailshafts with a propeller fitted to the shaft by means of a coupling flange must be examined as follows:

(1) Each flanged tailshaft with water lubricated bearings must be drawn for examination. At each examination, in addition to a visual inspection of the entire shaft, the flange, fillet at the propeller end and each coupling bolt must be nondestructively tested.

(2) Each flanged tailshaft with oil lubricated bearings must be examined as prescribed in paragraph (c)(1) of this section or as follows;

(i) The shaft must be shifted aft, as directed by the attending marine inspector, to expose the after end of its bearing contact area;

(ii) The exposed bearing contact area, flange fillet at the propeller end, and each coupling bolt must be nondestructively tested; and

(iii) The shaft's bearing clearance, seals, and lubricating system must be inspected.

(d) If any defects are detected after a tailshaft is shifted for examination, the attending marine inspector may direct that the tailshaft be drawn for further examination of the shaft, seals, and bearings.

(46 U.S.C. 375, 390b, 391a, 416; 49 U.S.C. 1655(b)(1); 49 CFR 1.46(b))

[CGD 78-153, 45 FR 52388, Aug. 7, 1980; CGD 78-153A, 45 FR 62071, Sept. 18, 1980]

§ 61.20-21 Extension of examination interval

(a) The Officer in Charge, Marine Inspection, may extend the interval between tailshaft examinations as follows;

(1) An extension to the next drydocking period may be granted, except that the period of extension shall not exceed six months.

(2) If a vessel has had a long period of layup after its last tailshaft examination, an extension equal to the time the vessel has been laid up may be granted, except that the period of extension shall not exceed one year for vessels that have tailshafts with oil lubricated bearings and six months for all other vessels.

(3) An extension of up to two years may be granted to vessels that have tailshafts with oil lubricated bearings if:

(i) Each tailshaft is examined in place with consideration given to the condition of the shafts' bearing clearance, seals, and lubricating system;

(ii) No major repairs by grinding or welding have ever been made to the shaft; and

(iii) Review of the vessel's file, drydock reports, and operations since its last tailshaft examination shows no deficiencies exist that would preclude the extension.

(46 U.S.C. 375, 390b, 391a, 416; 49 U.S.C. 1655(b)(1); 49 CFR 1.46(b))

[CGD 78-153, 45 FR 52388, Aug. 7, 1980]

§ 61.20-23 Tailshaft clearance; bearing weardown.

(a) Water lubricated bearings, other than rubber, must be rebushed as follows:

(1) Where the propelling machinery is located amidship, the after stern tube bearing must be rebushed when it is worn down to 6.4 mm (0.25 in) clearance for shafts of 229 mm (9 in) or less in diameter, 7.95 mm (0.3125 in) clearance for shafts exceeding 229 mm (9 in) but not exceeding 305 mm (12 in) in diameter, and 9.53 mm (0.375 in) clearance for shafts exceeding 305 mm (12 in) in diameter.

(2) Where the propelling machinery is located aft, the after stern tube bearing must be rebushed when weardown is 1.6 mm (.0625 in) less than the applicable clearance for propelling machinery located amidship.

(b) Water lubricated rubber bearings must be rebushed when any water groove is half the original depth.

(c) Oil lubricated bearings must be rebushed when deemed necessary by the Officer in Charge, Marine Inspection. The manufacturer's recommendation shall be considered in making this determination.

(46 U.S.C. 375, 390b, 391a, 416; 49 U.S.C. 1655(b)(1); 49 CFR 1.46(b))

[CGD 78-153, 45 FR 52388, Aug. 7, 1980]

Subpart 61.25—Periodic Tests and Inspections of Nuclear Reactor Power Plants

§ 61.25-1 General standards and requirements.

(a) Tests and inspections of nuclear ships and power plants shall have the objective of insuring that the equipment and structure are in satisfactory condition, and that the ship and power plant can continue to operate with reasonable assurance that the health and safety of the public will not be endangered.

(b) Prior to the annual inspection for certification of a nuclear ship, it must be ascertained that its owner or operator possesses a valid operating license issued by the Atomic Energy Commission. In the case of a ship not yet possessing such a license, the Coast Guard must be furnished evidence that the Atomic Energy Commission believes that the nuclear aspects of the plant may continue to be operated safely.

(c) A listing of inspection requirements for pressurized water reactors is available from the Commandant.

§ 61.25-5 Special preparations.

(a) When hydrostatic tests are required for a pressure vessel containing radioactive materials, the danger exists of spilling the contents and exposing personnel should the vessel leak or fail.

(b) Before any tests, the ship's health physics personnel shall determine that the level of radioactivity in the system to be tested is at a safe level. Annual hydrostatic tests of pressure vessels may be scheduled throughout the year if the waste disposal schedule makes that practice more feasible. This would be conducted in a manner similar to staggered boiler inspections on vessels having many boilers.

(c) Operating staff should refamiliarize themselves with the emergency methods of decay heat removal to be put into operation so that in the event of a failure of the primary system while under test, adequate decay heat removal may be obtained without delay.

(d) During these inspections, ship owners will provide the marine inspectors with the same radiation monitoring devices and dosage records as provided for the ship's crew working in the same spaces. Marine inspectors will follow the routine procedures as established by the ship or shipyard health physics staff.

PART 62—[RESERVED]

PART 63—CONTROL SYSTEMS FOR AUTOMATIC AUXILIARY HEATING EQUIPMENT

Subpart 63.01—Scope

Sec.

63.01-1 General.
63.01-5 Adoption of standards and specifications.

Subpart 63.05—Large Automatic Auxiliary Heating Equipment

63.05-1 Scope.
63.05-5 Plan approval.
63.05-15 Construction.
63.05-20 Controls.
63.05-25 Programing control system.
63.05-30 Operating control system.
63.05-35 Flame safeguard control system.
63.05-40 Limit control system.
63.05-45 Combustion control system.
63.05-50 Fuel supply control system.
63.05-55 Ignition system.
63.05-60 Detail requirements for operating water level controls and low-water cutoff controls.
63.05-65 Fuel pumps.
63.05-70 Strainers.
63.05-75 Fuel oil.
63.05-80 Alarms.
63.05-85 Wiring of electrical components.
63.05-90 Inspection and tests.
63.05-95 Instruction booklets.

Subpart 63.10—Small Automatic Auxiliary Heating Equipment

63.10-1 Scope.
63.10-5 Plan approval.
63.10-15 Construction.
63.10-20 Controls, general.
63.10-30 Operating control system.
63.10-35 Flame safeguard control system.
63.10-40 Limit control systems.
63.10-45 Combustion control system.
63.10-50 Fuel supply control system.
63.10-55 Ignition system.
63.10-60 Detail requirements for operating water level controls and low-water cutoff controls.
63.10-65 Fuel pumps.
63.10-70 Strainers.
63.10-75 Fuel oil.
63.10-80 Alarms.
63.10-85 Wiring of electrical components.
63.10-90 Inspection and tests.

Subpart 63.15—Electric Storage Tank Hot Water Supply Boilers (Heaters)

63.15-1 Scope.

Sec.
63.15-5 Plan approval.
63.15-10 Construction.
63.15-15 Heating elements.
63.15-20 Temperature regulating controls.
63.15-25 Temperature limiting controls.
63.15-30 Temperature-pressure relief device.
63.15-35 Unspecified details.
63.15-40 Operating test.

AUTHORITY: R.S. 4405, as amended, 4462, as amended, sec. 633, 63 Stat. 545, sec. 6(b)(1), 80 Stat. 938; 46 U.S.C. 375, 416, 14 U.S.C. 633, 49 U.S.C. 1655(b); 49 CFR 1.4(a)(2), (f). R.S. 4417, as amended, 4417a, as amended, 4418, as amended, 4426-4431, as amended, 4433, as amended, 4434, as amended, 4488, as amended, 4491, as amended, sec. 14, 29 Stat. 690, as amended, sec. 10, 35 Stat. 428, as amended, 41 Stat. 305, as amended, secs. 1, 2, 49 Stat. 1544, 1545, as amended, sec. 17, 54 Stat. 166, as amended, sec. 3, 54 Stat. 347, as amended, sec. 3, 70 Stat. 152, sec. 3, 68 Stat. 675; 46 U.S.C. 391, 391a, 392, 404-409, 411, 412, 481, 489, 366, 395, 363, 367, 526p, 1333, 390b, 50 U.S.C. 198; E.O. 11239, July 31, 1965, 30 FR 9671, 3 CFR, 1965 Supp., unless otherwise noted.

SOURCE: CGFR 68-82, 33 FR 18892, Dec. 18, 1968, unless otherwise noted.

Subpart 63.01—Scope

§ 63.01-1 General.

(a) Vessels when equipped with automatic auxiliary heating equipment shall be provided with control systems meeting the applicable requirements in this part.

(b) The requirements for control systems for automatic steam boilers, hot water boilers, fluid heaters, and auxiliary heating units are in three independent subparts for convenience and clarity as follows:

(1) *Subpart 63.05, Large Automatic Auxiliary Heating Equipment.* This covers requirements for oil fired units with a fuel rate greater than 3 gallons of fuel per hour (approximately 400,000 B.t.u./hr.).

(2) *Subpart 63.10, Small Automatic Auxiliary Heating Equipment.* This covers requirements for oil fired units with a fuel rate of 3 gallons of fuel per hour (approximately 400,000 B.t.u./hr.) and below.

(3) *Subpart 63.15, Electric Storage Tank Hot Water Supply Boilers.* This covers requirements for units that heat water by means of electric heating elements rated at not more than 600 volts with storage tanks (pressure vessels) which are not open to the atmosphere.

§ 63.01-5 Adoption of standards and specifications.

(a) *General.* As stated in Subpart 50.15 of this subchapter, the standards and specifications specifically referred to in this part shall be the governing requirements for the subject matters covered unless specifically limited, modified or replaced by other regulations in this subchapter.

(b) *American Society for Testing and Materials (ASTM).* The specifications of the American Society for Testing and Materials referenced in this part are adopted and form a part of this subchapter.

(c) *National Bureau of Standards commercial standards (CS).* The commercial standards of the National Bureau of Standards (Commerce Department) referenced in this part are adopted and form a part of this subchapter.

(d) *National Fire Protection Association (NFPA).* The standards and codes of the National Fire Protection Association referenced in this part are adopted and form a part of this subchapter.

(e) *Underwriters' Laboratories, Inc. (UL).* The specifications of the Underwriters' Laboratories, Inc., referenced in this part are adopted and form a part of this subchapter.

(f) *American National Standards Institute (ANSI).* The standards of the American National Standards Institute, referenced in this part are adopted and form a part of this subchapter.

(Sec. 552, 80 Stat. 383, as amended; 5 U.S.C. 552)

[CGFR 68-82, 33 FR 18892, Dec. 18, 1968, as amended by CGD 73-254, 40 FR 40169, Sept. 2, 1975]

Subpart 63.05—Large Automatic Auxiliary Heating Equipment

§ 63.05-1 Scope.

(a) This subpart covers requirements for the control systems and accessories for automatic steam boilers, hot water boilers, fluid heaters, and similar oil fired units with a fuel rate greater than 3 gallons of fuel per hour (approximately 400,000 B.t.u./hr.).

§ 63.05-5 Plan approval.

(a) Plans shall be submitted for approval prior to the assembly or manufacture of the equipment. Refer to Subpart 50.20 of this subchapter for procedures to follow in submitting plans. Sufficient information shall be submitted to enable determination of compliance with the regulations in this chapter.

(b) The plans submitted shall include:

(1) Specifications or description of the equipment.

(2) General arrangement of the unit with all associated equipment and a parts list identifying each piece by name of manufacturer, drawing number and/or catalog number and material specification.

(3) Schematic diagram of the control system with a written description or a line sequence diagram giving the sequence of events.

(4) Wiring diagrams with bills of material.

(5) Enclosure drawings of cabinet and panels.

(6) Instruction booklets which are required by § 63.05-95.

§ 63.05-15 Construction.

(a) The construction of auxiliary boilers and heating boilers shall meet the applicable requirements as found in Table 54.01-5(a) of this subchapter.

(b) All electrical and mechanical control devices shall be of a type tested and found satisfactory by a test laboratory acceptable to the Commandant, such as the Underwriters' Laboratories, Inc., Factory Mutual Laboratory, or a recognized inspection board, or shall be specifically approved by the Commandant.

(c) All devices and components shall be designed to perform satisfactorily in marine service. The heating unit and control equipment shall be designed to permit satisfactory operation with a momentary roll of 30° and with a permanent list of 15° and a permanent trim of 5° with the unit installed in the position specified by the manufacturer.

(d) All rotating or moving mechanical and exposed electrical parts shall be protected against accidental contact. All electrical devices shall be enclosed in dripproof or watertight enclosures.

§ 63.05-20 Controls.

(a) Each automatic auxiliary heating unit shall be fitted with the following control systems:

(1) Programing Control System.
(2) Operating Control System.
(3) Flame Safeguard Control System.
(4) Limit Control System.
(5) Combustion Control System.
(6) Fuel Supply Control System.
(7) Ignition System.

(b) Control systems (including relays, switches, and other auxiliary equipment used in conjunction therewith) shall be designed and utilized to prevent unsafe operation of the unit. The control equipment shall be so designed that as far as practicable any failure of this equipment will prevent continued operation and cause the fuel supply to be cut off.

(c) Control systems of the electrical (relay) type shall be designed to operate via an isolation transformer. One side of the secondary shall be grounded and all coils shall be connected between the grounded side and the operating contacts. All overcurrent devices, switches and contacts shall be connected to the ungrounded or hot side of the circuit. Electronic (tube and solid state) systems shall be designed to similarly prevent false or safety bypassing as a result of system electrical grounds.

(d) Electrical controls shall be provided to shut down the unit from a position outside the compartment in which it is located, so that fuel will not be supplied to the fuel burning equipment. The entire unit shall be disconnected from all sources of potential by means of one disconnect switch located adjacent to the heating unit.

(e) Mercury tube actuated controls are prohibited.

[CGFR 68-82, 33 FR 18892, Dec. 18, 1968, as amended by CGFR 70-143, 35 FR 19906, Dec. 30, 1970]

§ 63.05-25 Programing control system.

(a) The programing control system shall be connected to the combustion control system and the safety interlocks, as required, to provide safe operation upon starting, stopping, and cycling between temperature or pressure limits.

(b) The programing control shall cycle the unit in accordance with a predetermined sequence. The sequence of operation shall include the following:

(1) A prepurge period for a sufficient duration to assure a minimum of four changes of air in the combustion chamber and convecting spaces, but not less than 15 seconds.

(2) Ignition (spark coming on) shall occur only before or simultaneously with the opening of the fuel oil valve and shall remain energized during the trial for ignition period.

(3) A postpurge period of at least 15 seconds after the closing of the fuel valve.

(4) When controls are provided to modulate the air to fuel ratio, the modulating air control shall be opened sufficiently to provide the required prepurge.

(5) For high-low-off and modulating controls, ignition shall occur only when the controls are in the low-fire position.

§ 63.05-30 Operating control system.

(a) Each automatic heating unit shall be equipped with the appurtenances and controls necessary to automatically start, cycle, and stop the unit in response to the demand for heat.

(b) Steam boilers shall be provided with operating controls that will control the fuel supply to the burner so as to maintain the steam pressure within the designed operating range.

(c) Hot water boilers and fluid heaters shall be provided with operating controls that will control the fuel supply to the burner so that the temperature of the water or fluid is maintained within the designed operating range.

(d) Each drum type steam boiler shall be provided with a feed water control system that will automatically supply the required amount of feed water to maintain the proper level or, for boilers without a fixed water level, supply the proper amount to assure proper heat transfer. The system shall provide for filling the boiler when cold.

(e) Fluid heaters shall be provided with a circulating system that will provide a sufficient fluid circulation to ensure adequate heat transfer.

§ 63.05-35 Flame safeguard control system.

(a) The flame safeguard control shall consist of a flame sensing element and associated equipment connected to the programing control to provide for shut down of the unit in the event of ignition failure and flame failure during the firing cycle. The flame safeguard control shall be so designed that the failure of any component will cause a safety shut down and prevent automatic restarting.

(b) The flame safeguard control shall be capable of closing the fuel valves in not more than 4 seconds after a flame failure.

(c) The flame safeguard control shall provide a trial-for-ignition period of not more than 10 seconds during which fuel may be supplied to establish flame. If flame is not established within 10 seconds the fuel supply to the burners shall be immediately shut off automatically. Where a light oil pilot is used the flame safeguard control shall provide a trial-for-ignition period for the pilot of not more than 10 seconds. If flame is not established within 10 seconds the fuel supply to the pilot shall be immediately shut off automatically.

(d) Whenever the flame safeguard control has operated because of failure of ignition, flame failure, or failure of any component, manual reset of the flame safeguard control shall be required for restart.

(e) Flame safeguard controls of the thermostatic type, such as stack switches and pyrostats operated by means of an open bimetallic helix, are prohibited.

§ 63.05-40 Limit control system.

(a) Limit controls consisting of various control actuators interlocked with the burner circuit to prevent startup, and to cause safety shut down when firing, if unsafe firing conditions exist, shall be provided as specified in this section.

(b) Drum type steam boilers with a fixed water level shall be provided with two low-water cutoffs. They shall prevent startup and shall shut down the burner if the water level is not at or above a minimum safe level. The cutoffs shall operate at different water levels and the lower shall operate when the water surface falls to a level no lower than that visible in the gauge glass.

(1) The upper low-water cutoff may be arranged to operate in conjunction with the operating water level control.

(2) The lower low-water cutoff shall have a connection to a drum nozzle of the boiler independent of the upper low-water cutoff and shall be so arranged that upon operation, both fuel control solenoid valves required by § 63.05-50(a) shall be deenergized. After the lower low-water cutoff functions, the resetting of a manual device shall be required before the boiler can be restarted.

(c) Steam boilers and hot water boilers without a fixed water level shall be provided with a cutout device or the equivalent, which will cut off the fuel supply to the burners in case of interruption of the feed water supply. This device shall be of the manual reset type.

(d) Fluid heaters shall be provided with a low fluid level cutout device or a low flow device to cut off the fuel supply to the burner in case of insufficient rate of fluid flow through the heating coils to ensure proper heat transfer. These devices shall be of the manual reset type.

(e) Fluid heaters shall be provided with a high temperature limit device installed in the fluid outlet that will cut off the fuel supply to the burner if the fluid temperature exceeds the designed maximum operating temperature. This device shall be of the manual reset type.

(f) A draft loss interlock switch shall be provided for units with forced draft. This switch shall prevent startup and shall shut down the burner when air flow is inadequate to support satisfactory combustion.

(g) An oil pressure interlock switch shall be provided to initiate a safety shutdown when the oil pressure to the burner falls below the value required for safe combustion.

(h) A fuel oil temperature limit interlock shall be provided for units designed to burn heavy oil. This interlock shall prevent the unit from being started and shall automatically shut off the fuel oil to the burners if the temperature of the fuel oil at the fuel oil heater outlet falls below the design temperature.

(i) Other interlocks shall be provided to prevent startup and/or cause shutdown of the unit as specified by the manufacturer.

§ 63.05-45 Combustion control system.

(a) A combustion control system shall be provided to insure a satisfactory fuel-to-air ratio under all designed operating conditions.

(1) When the burner is a fixed rate "on-off" type the combustion control system shall insure burner operation at the optimum firing rate by maintaining a fixed mechanical relationship between the area of the air damper opening and the rate of fuel flow to the burner. The air controls shall be manually adjustable in the event a change of the fuel-air ratio is required. For this system the programing control system shall cycle the burner on and off to meet the load demand.

(2) When the burner control is a "high-low-off" system, the combustion controls shall position the air and fuel supply openings for low fire and high fire in order to maintain the preset pressure or temperature as the load demand varies. The fuel control valve (or other suitable metering device) and the draft damper shall be power operated and shall be manually adjustable so as to maintain the proper fuel-air-ratio at both firing rates. A low-fire interlock to insure low-fire start shall be provided (see § 63.05-25(b)(5)).

(3) When the combustion control is a modulating type, the system shall provide a satisfactory fuel-air ratio throughout the range of firing rates.

Power operated actuators shall be provided to position the fuel control system and the draft dampers. Means for manually adjusting the air-fuel ratio shall be provided for all firing rates permitted by the burner turndown ratio. A low-fire interlock to insure low-fire start shall be provided (see § 63.05-25(b)(5)).

§ 63.05-50 Fuel supply control system.

(a) Two fuel control solenoid valves shall be provided in series in the fuel supply line to the burner. The valves shall be connected electrically in parallel so that both operate simultaneously.

(b) In addition to providing the fuel shutoff in case of ignition or flame failure, fuel shutoff shall occur in the event of low water, high steam pressure, high fluid temperature or low flow, inadequate or complete loss of draft, low voltage, low fuel pressure, or other abnormal condition.

§ 63.05-55 Ignition system.

(a) An automatic ignition system shall be provided. Ignition of the fuel oil may be accomplished by high voltage electric spark, high energy electric spark, or light oil pilot. Gas pilots are prohibited.

(b) High-tension transformers shall be rated at not less than 10,000 volts on the secondary side. The ignition transformer shall conform to requirements of Underwriters' Laboratories, Inc., UL 506, Standard for Specialty Transformers.

(c) Ignition cable shall conform to requirements of Underwriters' Laboratories, Inc., UL 814, Standard for Gas-Tube-Sign and Ignition Cable. The cable shall have a voltage rating equal to or greater than the rated secondary voltage of the ignition transformer.

§ 63.05-60 Detail requirements for operating water level controls and low-water cutoff controls.

(a) The requirements of this section apply to boilers having a definite liquid line. Boilers designed to operate with no definite water line will be given special consideration by the Commandant.

(b) Operating level controls and low-water cutoffs may be of the float type, electrode probe type, thermostatic expansion tube, or thermohydraulic type, or such other type acceptable to the Commandant. Float chamber type low-water cutoffs using stuffing boxes to transmit the motion of the float from the chamber to the external switches are prohibited.

(c) Water level controls shall be so located as to minimize the effect of vessel roll and pitch.

(d) Water level devices shall be so constructed that the water inlet valve cannot feed water into the boiler through the float chamber.

(e) The minimum size of pipes connecting a float chamber to a boiler shall be 1 inch. Shutoff valves fitted in connecting piping shall be either outside-screw-and-yoke or lever lifting type gate valves, or stopcocks having levers permanently fastened thereto and marked in line with the passageway, or of such other through construction as to prevent stoppage by deposits of sediment and also constructed to indicate by the position of the operating mechanism whether open or closed. Where stopcocks are used they shall be of a type having the plug held in place by a guard or gland.

(f) No outlet connection except for pressure controls, water columns, drains, or steam gages shall be placed on the float chamber or on the pipes connecting the float chamber to the boiler on which it is mounted.

(g) Float or electrode chambers shall be equipped with a suitable drain connection not less than ¾-inch pipe size.

(h) Float operated water control or cutoff devices shall be so constructed as not to be damaged in case of water levels above or below the intended operating and cutoff levels.

§ 63.05-65 Fuel pumps.

(a) Fuel pumps shall conform to requirements of Underwriters' Laboratories, Inc., UL 343, Standard for Pumps for Oil-Burning Appliances.

§ 63.05-70 Strainers.

(a) Duplex fuel oil strainers, single strainers of the self-cleaning type or single strainers fitted with a bypass shall be installed in the supply line to the fuel oil pump.

(b) The strainers shall conform to requirements for strainers in Underwriters' Laboratories, Inc., UL 296, Standard for Oil Burners and the requirements of Part 56 of this subchapter for fluid conditioner fittings.

§ 63.05-75 Fuel oil.

(a) The burner shall be so designed to burn one or more of the five grades of hydrocarbon oil, as defined by the National Bureau of Standards, Commerce Department, commercial standard, CS-12, Specification for Fuel Oil, or American Society for Testing Material standard ASTM-D396, Specifications for Fuel Oils. In either specification the term "light oil" refers to Grade Nos. 1, 2, and 4, and the term "heavy oil" refers to Grade Nos. 5 and 6.

(b) Where heavy fuel is used a thermostatically controlled electric oil heater shall be furnished.

§ 63.05-80 Alarms.

(a) For steam boilers, operation of the lower low-water cutoff shall cause an audible alarm to be automatically sounded. A visible indicator shall show that the shutdown was caused by low water.

(b) If shutdown is due to the flame safety system, an audible alarm shall be automatically sounded. A visible indicator shall show that shutdown was caused by the flame safety system.

(c) Means shall be provided to silence the audible alarm. The visible indicators shall be designed so that manual reset is required.

§ 63.05-85 Wiring of electrical components.

(a) All wiring shall be in accordance with Subchapter J (Electrical Engineering) of this chapter or Underwriters' Laboratories, Inc., Standard for Oil Burners, UL 296.

(b) Electric cable shall be of the type specified by § 111.60-1(d)(1) of Subchapter J (Electrical Engineering) of this chapter for damp or wet locations or National Electrical Code moisture resistant type or other type approved by the Commandant. Cable shall be rated for the maximum temperature that will be encountered after installation.

(c) All conductors shall be stranded and not smaller than No. 18 AWG.

(d) Wire sizes and overcurrent protection shall be in accordance with the applicable requirements of Subchapter J (Electrical Engineering) of this chapter or the National Electrical Code.

(e) Conduit or other suitable mechanical protection shall be provided where cable is liable to damage. All conduit runs shall be adequately drained.

§ 63.05-90 Inspection and tests.

(a) Each heating unit shall be carefully examined by a marine inspector to determine compliance with the regulations and approved drawings. This inspection shall be made while the unit is under construction in accordance with Part 52 or Part 53 of this subchapter as applicable.

(b) An operating test after installation shall be conducted to insure that all the control components have been properly installed and that all parts of the boiler, including controls and safety devices, are in satisfactory operating condition.

(1) *Flame safeguard.* The operation of the flame safeguard system shall be verified by causing flame and ignition failures. Operation of the audible alarm and visible indicator shall be verified. The shutdown times shall be verified by stopwatch.

(2) *Limit controls.* Shutdown due to the operation of the limit controls shall be verified.

(i) *Water level controls.* Water level controls shall be tested by slowly lowering the water level in the boiler. The operating water level controls and the upper and lower low-water cutoff shall be tested individually. The operation of the audible alarm and visible indicator associated with the lower low-water cutoff shall be verified. The manual reset device shall be tested after operation of the lower low-water cutoff.

(ii) *Water flow controls.* Steam boilers and water heaters without water level controls shall have the feed water flow limit device tested by interrupting the feed water supply. Manual reset shall be required prior to restarting the unit.

(iii) *Fluid heater flow and level controls.* The level limits and flow controls shall be tested in the same manner as the boiler tests in paragraph (b)(2) and paragraph (b)(2)(ii) of this section.

(iv) *Fluid heater high temperature.* The fluid temperature limit shall cut off the fuel to the burner when the fluid temperature at the heater outlet exceeds the designed maximum operating temperature. Manual reset shall be required prior to restarting the unit.

(v) *Draft limit control.* The draft loss interlock switch shall be tested by stopping the blower motor or blocking the draft opening. It shall be determined that this switch will operate to prevent startup and cause shutdown of the burner in case of inadequate air supply to the burner.

(vi) *Oil pressure limit control.* The lowering of the fuel oil pressure below the value required for safe combustion shall initiate a safety shutdown.

(vii) *Fuel oil temperature limit control.* (Units designed to burn heavy oil). The lowering of the fuel oil temperature below the designed temperature shall initiate a safety shutdown and prevent startup.

(viii) *Other interlocks.* Other interlocks provided shall be tested for proper operation as specified by the unit manufacturer.

(3) *Combustion controls.* The combustion control shall be stable and operate smoothly.

(4) *Programing controls.* Programing controls shall be verified as controlling and cycling the unit in the intended manner. Proper prepurge, ignition, postpurge, and modulation shall be verified. A stopwatch shall be used for verifying intervals of time.

(5) *Fuel supply controls.* The satisfactory operation of the two fuel control solenoid valves for all conditions of operation and shutdown shall be verified.

(6) *Low voltage test.* A low voltage test shall be conducted to satisfactorily demonstrate that the fuel supply to the burners will be automatically shut off before any boiler malfunction results from the reduced voltage.

(7) *Switches.* All switches shall be tested to verify proper operations.

§ 63.05-95 Instruction booklets.

(a) Prior to the issuance of final approval of the boiler(s) one (1) copy of the instruction booklet shall be submitted for approval. It shall provide a full description of the heating unit and all auxiliaries and complete instructions for installation and operation of the unit.

Subpart 63.10—Small Automatic Auxiliary Heating Equipment

§ 63.10-1 Scope.

(a) This subpart covers requirements for the control systems and accessories for small automatic steam boilers, hot water boilers, fluid heaters, and similar oil fired units with a fuel rate of 3 gallons of fuel per hour (approximately 400,000 B.t.u./hr.) or less.

§ 63.10-5 Plan approval.

(a) Plans shall be submitted for approval prior to the assembly or manufacture of the equipment. (Refer to Subpart 50.20 of this subchapter for procedures to follow in submitting plans.) Sufficient information shall be submitted to enable determination of compliance with the requirements of this and other parts of this chapter.

(b) The plans submitted shall include:

(1) Specifications or a description of the equipment.

(2) General arrangement of the unit with all associated equipment and a parts list identifying each piece by name of manufacturer, drawing number and/or catalog number, and material specification.

(3) Schematic diagram of the control system with a written description or a line sequence diagram giving the sequence of events.

(4) Wiring diagrams with bills of material.

(5) Enclosure drawings of cabinets and panels.

§ 63.10-15 Construction.

(a) The construction of auxiliary heating units shall meet the applicable requirements as found in Table 54.01-5(a) of this subchapter.

(b) All electrical and mechanical control devices shall be of a type tested and approved by a test laboratory acceptable to the Commandant, such as the Underwriters' Laboratories, Inc., Factory Mutual Laboratory, or a recognized inspection board, or shall be specifically approved by the Commandant.

(c) All devices and components shall be designed to perform satisfactorily in marine service. The heating unit and control equipment shall be designed to permit satisfactory operation with a momentary roll of 30° and with a permanent list of 15° and a permanent trim of 5° with the unit installed in the position specified by the manufacturer.

(d) All electrical devices shall be enclosed in dripproof or watertight enclosures. All rotating or moving mechanical and exposed electrical parts shall be protected against accidental contact.

§ 63.10-20 Controls, general.

(a) The entire unit shall be disconnected from all sources of potential by means of one disconnect switch located near the heating unit.

(b) Mercury tube actuated controls are prohibited.

(c) A prepurge period of sufficient duration to assure at least four changes of air in the combustion chamber and stack, but not less than 15 seconds shall be provided. Ignition shall occur only before or simultaneously with the opening of the fuel oil valve.

(d) Each heating unit shall be provided with the following control system when applicable:

(1) Operating Control System.

(2) Flame Safeguard Control System.

(3) Limit Control System.

(4) Combustion Control System.

(5) Fuel Supply Control System.

(6) Ignition System.

§ 63.10-30 Operating control system.

(a) Each automatic heating unit shall be equipped with the appurtenances and controls necessary to automatically start, cycle, and stop the unit in response to the demand for heat.

(b) Steam boilers shall be provided with operating controls that will control the fuel supply to the burner so as to maintain the steam pressure within the designed operating range.

(c) Hot water boilers and fluid heaters shall be provided with operating controls that will control the fuel supply to the burner so that the temperature of the water or fluid is maintained within the designed operating range.

(d) Each drum type steam boiler shall be provided with a feed water control system that will automatically supply the required amount of feed water to maintain the proper level or, for boilers without a fixed water level, supply the proper amount to assure proper heat transfer. The system shall provide for filling the boiler when cold.

(e) Fluid heaters shall be provided with a circulating system that will provide a sufficient fluid circulation to ensure adequate heat transfer.

§ 63.10-35 Flame safeguard control system.

(a) The flame safeguard control shall consist of a flame or heat sensing element and associated equipment so arranged to provide for the shutoff of the fuel supply to the burner in the event of ignition failure and flame failure during the firing cycle.

(b) The flame safeguard control shall provide a trial-for-ignition period of not more than 90 seconds during which time fuel may be supplied to establish flame. If flame is not established within 90 seconds the fuel supply to the burners shall be shut off.

(c) After trial-for-ignition the flame safeguard control shall supervise the main flame. In case the flame fails during the firing cycle, the flame safeguard shall cause the fuel supply to the burners to be cut off within 90 seconds.

§ 63.10-40 Limit control systems.

(a) Boilers with a fixed water level shall be provided with a low-water cutout that will cut off the fuel supply to the burner if the water level drops to an unsafe level. This device shall be of the manual reset type.

(b) Steam boilers and hot water boilers without a fixed liquid level shall be provided with a cutout device, or the equivalent, which will cut off the fuel supply to the burners in case of interruption of the feed water supply. This device shall be of the manual reset type.

(c) Fluid heaters shall be provided with a low fluid level cutout device or a low flow device to cut off the fuel supply to the burner in case of insufficient fluid level or rate of fluid flow to insure proper heat transfer. These devices shall be of the manual reset type.

(d) Fluid heaters shall be provided with a high temperature limit device installed in the fluid outlet that will cut off the fuel supply to the burner if the fluid temperature exceeds the designed maximum operating temperature. This device shall be of the manual reset type.

(e) Other limits necessary to prevent unsafe operation shall be provided to prevent startup and to cause shutdown of the burner as specified by the manufacturer.

§ 63.10-45 Combustion control system.

(a) A combustion control system shall be provided to insure a satisfactory fuel-to-air ratio under all designed operating conditions. The combustion controls shall insure burner operation at the optimum firing rate by maintaining a fixed mechanical relationship between the area of the air opening and the rate of fuel flow to the burner. The air controls shall be manually adjustable.

(b) For other combustion arrangements such as "high-low-off" or the modulating type, the applicable requirements of § 63.05-45 shall be met.

§ 63.10-50 Fuel supply control system.

(a) Means shall be provided to supply fuel at the optimum pressure to the burner.

(b) A fuel control solenoid valve shall be provided in the fuel supply line to the burner. The valve shall cut off the fuel to the burner in case of ignition failure, flame failure, and low water, or in the case of fluid heaters high fluid temperature, low flow or low level.

§ 63.10-55 Ignition system.

(a) An automatic ignition system shall be provided. Ignition of the fuel oil may be accomplished by high voltage electric spark, high energy electric spark, or light oil pilot. Gas pilots are prohibited.

(b) High-tension transformers shall be rated at not less than 10,000 volts on the secondary side. The ignition transformer shall conform to requirements of Underwriters' Laboratories, Inc., UL 506, Standard for Specialty Transformers.

(c) Ignition cable shall conform to requirements of Underwriters' Laboratories, Inc., UL 814, Standard for Gas-Tube-Sign and Ignition Cable. The cable shall have a voltage rating equal to or greater than the rated secondary voltage of the ignition transformer.

§ 63.10-60 Detail requirements for operating water level controls and low-water cutoff controls.

(a) The requirements of this section apply to boilers having a definite liquid line. Boilers designed to operate with no definite water line will be given special consideration by the Commandant.

(b) Operating level controls and low-water cutoffs may be of the float type, electrode probe type, thermostatic expansion tube, or thermohydraulic type, or such other type acceptable to the Commandant. Float chamber type low-water cutoffs using stuffing boxes to transmit the motion of the float from the chamber to the external switches are prohibited.

(c) Water level controls shall be so located as to minimize the effect of vessel roll and pitch.

(d) Water level devices shall be so constructed that the water inlet valve cannot feed water into the boiler through the float chamber.

(e) The minimum size of pipes connecting a float chamber to a boiler shall be 1 inch. Shutoff valves fitted in connecting piping shall be either outside-screw-and-yoke or lever lifting type gate valves, or stopcocks having levers permanently fastened thereto and marked in line with the passageway, or of such other through construction as to prevent stoppage by deposits of sediment and also constructed to indicate by the position of the operating mechanism whether open or closed. Where stopcocks are used they shall be of a type having the plug held in place by a guard or gland.

(f) No outlet connection except for pressure controls, water columns, drains, or steam gauges shall be placed on the float chamber or on the pipes connecting the float chamber to the boiler on which it is mounted.

(g) Float or electrode chambers shall be equipped with a suitable drain connection not less than ¾-inch pipe size.

(h) Float operated water control or cutoff devices shall be so constructed as not to be damaged in case of water levels above or below the intended operating and cutoff levels.

§ 63.10–65 Fuel pumps.

(a) Fuel pumps shall conform to the requirements of Underwriters' Laboratories, Inc., UL 343, Standard for Pumps for Oil Burning Appliances.

§ 63.10–70 Strainers.

(a) Duplex fuel oil strainers, single strainers of the self-cleaning type or single strainers fitted with a bypass shall be installed in the supply line to the fuel oil pump.

(b) The strainers shall conform to requirements for strainers in Underwriters' Laboratories, Inc., UL 296, Standard for Oil Burners and the requirements of Part 56 of this subchapter for fluid conditioner fittings.

§ 63.10–75 Fuel oil.

(a) The burner shall be designed to burn one or more of the three light oil grades of hydrocarbon oil, as defined by the National Bureau of Standards, Commerce Department, commercial standard, CS-12, Specification for Fuel Oil, or American Society for Testing Materials standard ASTM-D396, Specifications for Fuel Oils. In either specification the term "light oil" refers to Grade Nos. 1, 2, and 4.

§ 63.10–80 Alarms.

(a) Operation of the low-water cutoff shall cause a visible indicator to show that the shutdown was caused by low water.

(b) If shutdown is due to the flame safety system, a visible indicator shall show that shutdown was caused by the flame safety system.

§ 63.10–85 Wiring of electrical components.

(a) All wiring shall be in accordance with Subchapter J (Electrical Engineering) of this chapter of Underwriters' Laboratories, Inc., Standard for Oil Burners, UL 296.

(b) Electric cable shall be of the type specified by § 111.60-1(d)(1) of Subchapter J, of this chapter, for damp or wet locations or National Electrical Code moisture resistant type or other type approved by the Commandant. Cable shall be rated for the maximum temperature that will be encountered after installation.

(c) All conductors shall be stranded and not smaller than No. 18 AWG.

(d) Wire sizes and overcurrent protection shall be in accordance with the applicable requirements of Subchapter J, of this chapter or the National Electrical Code.

(e) Conduit shall be provided where cable is liable to damage. All conduit runs shall be adequately drained.

§ 63.10–90 Inspection and tests.

(a) Each heating unit shall be carefully examined by a marine inspector to determine compliance with the regulations and approved drawings.

(b) An operating test after installation shall be conducted to insure that all the control components have been properly installed and that all parts of the boiler, including controls and safety devices, are in satisfactory operating condition.

(1) *Flame safeguard.* The operation of the flame safeguard system shall be verified by simulating flame and ignition failures. Operation of the audible alarm and visible indicator shall be verified. The shutdown times shall be verified by stopwatch.

(2) *Limit and miscellaneous controls.* Boiler shutdown due to the operation of boiler limit controls and miscellaneous control devices shall be verified.

(i) *Water level controls.* Water level controls shall be tested by slowly lowering the water level in the boiler. The operating water level controls and low-water cutoffs shall be tested individually. The operation of the visible indicator associated with the low-water cutoff shall be verified.

(3) *Combustion controls.* The combustion controls shall provide smooth light-off and stable operation.

(4) *Fuel supply controls.* The satisfactory operation of the fuel control solenoid valves for all conditions of operation and shutdown shall be verified.

Subpart 63.15—Electric Storage Tank Hot Water Supply Boilers (Heaters)

§ 63.15-1 Scope.

(a) This subpart covers requirements for units that heat water by means of electric heating elements rated at not more than 600 volts with storage tanks (pressure vessels) which are not open to the atmosphere.

§ 63.15-5 Plan approval.

(a) Except for electric water supply boilers listed by Underwriters Laboratories as meeting UL 174, plans shall be submitted for approval prior to the assembly or manufacture of the equipment. (Refer to Subpart 50.20 of this subchapter for procedures to follow in submitting plans.) Sufficient information shall be submitted to enable determination of compliance with the regulations of this and other parts of this chapter.

(b) The plans submitted shall include:

(1) Specifications or a description of the equipment.

(2) General arrangement of the unit with all associated equipment and a parts list identifying each piece by name of manufacturer, drawing number and/or catalog number, and material specification.

(3) Schematic diagram of the control system.

(4) Wiring diagram with bill of material.

(5) Enclosure drawings of cabinets and panels.

§ 63.15-10 Construction.

(a) The storage tank shall be constructed in accordance with the applicable requirements of Part 52 or Part 53 of this chapter. See § 53.01-10(c) of this chapter for possible exception.

(b) Electric hot-water supply boilers shall be marked where plainly visible with the name of the manufacturer, the catalog number or the equivalent, the water capacity, and the electrical ratings of each heating element. If two or more heating elements are provided, the maximum wattage or current consumption shall be indicated.

(c) The hot-water outlet and cold-water inlet shall be marked so as to be easily identified.

[CGFR 68-82, 33 FR 18892, Dec. 18, 1968, as amended by CGFR 69-127, 35 FR 9981, June 17, 1970]

§ 63.15-15 Heating elements.

(a) Heating elements shall be of a type that are insulated electrically from the water being heated. Heating elements shall be supported in a substantial and reliable manner and shall be protected against mechanical injury and contact with outside objects. A wrap-around element shall be so secured in place as to be prevented from loosening.

§ 63.15-20 Temperature regulating controls.

(a) Each heating element shall be so controlled by means of a suitable thermostat that the water will not attain a temperature of more than 90° C. (194° F.).

§ 63.15-25 Temperature limiting controls.

(a) Electric hot water supply boilers shall be provided with a temperature limiting device, in addition to and separate from the temperature regulating devices, that will prevent the water in the upper 25 percent of the tank from attaining a temperature higher than 99° C. (210° F.). This temperature limiting means:

(1) Shall be a manually reset device;

(2) Shall be trip-free from the operating means;

(3) Shall open all power supply conductors to the heater; and,

(4) Shall be readily accessible.

§ 63.15-30 Temperature-pressure relief devices.

(a) A suitable temperature-pressure relief valve must be provided which will operate to relieve the pressure in the water tank to prevent a pressure rise of more than 3 pounds per square inch above the maximum allowable working pressure and to prevent a temperature rise above 210° F. with the heating elements operating continuously at the maximum rating.

(b) Temperature-pressure relief valves meeting the requirements of ANSI standard Z 21.22 must be utilized.

[CGD 73-254, 40 FR 40169, Sept. 2, 1975]

§ 63.15-35 Unspecified details.

(a) Unspecified details such as electric supply connections, wiring terminals, and wiring shall be in accordance with Underwriters' Laboratories, Inc., Standard UL-174—Electric Storage Tank Water Heaters.

§ 63.15-40 Operating test.

(a) For electric water heaters listed by Underwriters' Laboratories, Inc., the heating element, temperature regulating controls, and temperature limiting controls shall be considered as acceptable and no further testing will be required. The pressure relief valve shall be tested as required by Part 52 or by Part 53 of this subchapter as applicable.

(b) For heaters not listed by Underwriters' Laboratories, Inc., all operating, limit, and safety devices and controls shall be tested by the marine inspector. Such tests may be conducted at the factory or aboard the vessel after installation. The pressure relief valve shall be tested as required by Part 52 or Part 53 of this subchapter as applicable.

PART 64—MARINE PORTABLE TANKS (MPT)

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AUTHORITY: R.S. 4472, as amended (46 U.S.C. 170), sec. 201, 86 Stat. 427 (46 U.S.C. 391a), sec. 6(b)(1), 80 Stat. 937 (49 U.S.C. 1655(b)(1)); 49 CFR 1.46(b) and (o)(4).

SOURCE: CGD 73-172, 39 FR 22950, June 25, 1974, unless otherwise noted.

Subpart A—General

§ 64.1 Purpose.

This Part contains—

(a) The requirements for the design, construction, testing, and stamping requirements of marine portable tanks which are authorized to be carried under §§ 30.01-5, 70.05-30, and 90.05-35 of this chapter;

(b) The design and construction requirements for cargo handling systems that are used in conjunction with these tanks; and

(c) The requirements for the periodic inspection required in Subpart 98.30 for these tanks and portable tanks approved under Subpart 98.35, which are authorized to be carried on vessels under §§ 30.01-5, 70.05-30, and 90.05-35 of this chapter.

§ 64.3 Applicability.

(a) To be approved under this part, a marine portable tank must meet the requirements in this Part and have a minimum service temperature of 0° F or more; and

(b) Contain more than 110 U.S. gallons of a liquid cargo that has a vapor pressure of 43 pounds per square inch absolute (psia) or less at a temperature of 122° F.

§ 64.5 Definitions.

As used in this Part:

(a) "Marine portable tank" or "MPT" means a liquid carrying tank that—

(1) Is designed to be carried on board a vessel;

(2) Can be lifted onto and off of a vessel in a filled or in an empty condition, or filled and discharged while on board a vessel; and

(3) Is not permanently attached to a vessel.

(b) "Tank" means the pressure vessel and the associated fittings of an MPT that come in contact with the product being carried.

(c) "Total containment pressure" means the minimum pressure for total product containment under normal operating conditions at a gauge pressure consisting of the absolute vapor pressure of the product at 122° F added to the dynamic pressure, based on the tank dimensions and the location of the relief devices, of not less than 5 pounds per square inch gauge (psig) at the top of the tank in the operating position.

(d) "Maximum allowable working pressure" means the maximum gauge pressure at the top of the tank in the operating position at 122° F, equal to or greater than the total containment pressure, as defined in paragraph (c) of this section. The maximum allowable working pressure is used in the calculation of the minimum thickness of each element of the tank, excluding the allowance for corrosion and the thickness required for loadings other than pressure, as provided for in Division 1 of Section VIII of the ASME Code, 1974 Edition.

(e) "Test pressure" means a hydrostatic pressure of at least one and one-half times the maximum allowable working pressure.

(f) "Dynamic loading conditions" means the following:

(1) A loading in the vertical down direction equal to 2 times the weight of the tank and the heaviest product carried.

(2) A loading in the transverse direction equal to the weight of the tank and the heaviest product carried.

(3) A loading in the longitudinal direction equal to the weight of the tank and the heaviest product carried.

(g) "Owner" means the person, corporation, company, partnership, or organization in which is vested the ownership, dominion, or title of a portable tank.

§ 64.7 Plan approval for an MPT.

(a) Each owner or manufacturer who desires an MPT and pressure relief devices on the tank to be approved by the Coast Guard must submit the following information in accordance with the procedures contained in § 50.20-5 of this chapter:

(1) The calculations for each pressure containment component including the working pressure, the hydrostatic test pressure, and the pressure relief device setting.

(2) The joint design and method of attachment of each pressure containment component.

(3) The design calculations and method of attachment of the foundations and supports.

(4) A listing of material meeting the requirements of Division 1 of Section VIII of the ASME Code, 1974 edition.

(5) A diagrammatic arrangement drawing of the assembled MPT that shows the location of each internal and external component.

(b) In addition to the requirement contained in paragraph (a) of this section, each owner or manufacturer who desires a cargo handling system to be tested and inspected must submit information to the U.S. Coast Guard in accordance with the requirements in § 56.01-10 of this chapter.

§ 64.9 Dangerous articles for which tanks may be approved.

Portable tanks may be approved for the following dangerous articles under this part:

(a) Acetone.

(b) Alcohol.

(c) Ethyl methyl acetone.

(d) Toluol (toluene).

(e) Xylol (xylene).

(f) Benzene (benzol).

(g) Gasoline.

(h) Hydrochloric—hydrofluoric acid mixtures containing not more than 2 percent hydrofluoric acid.

(i) Sulfuric acid of concentrations 65.25 percent or greater: *Provided,* The corrosive effect on steel measured at 100° F is not greater than that of 65.25 percent sulfuric acid.

(j) Sulfuric acid concentration not to exceed 51 percent, if the tank is rubberlined.

Subpart B—Standards for an MPT

§ 64.11 MPT design.

An MPT must be designed—

(a) In accordance with Division 1 of Section VIII of the ASME Code, 1974 edition, and this subpart;

(b) With a maximum gross weight of 55,000 pounds;

(c) With a maximum allowable working pressure of at least 20 pounds per square inch gauge (psig) but not more than 48 psig; and

(d) To withstand dynamic loading conditions applied simultaneously.

§ 64.13 Allowable stress; tank.

(a) The calculated stress in the tank under design conditions, including dynamic loading conditions applied simultaneously, must not exceed the allowable stress listed in Division 1 of Section VIII of the ASME Code, 1974 edition, for a design temperature of 122° F.

(b) The calculated stress in the tank at test pressure must not exceed 75 percent of the minimum yield stress,[1] or 37.5 percent of the minimum tensile stress[1] of the material, whichever is less.

§ 64.15 Allowable stress; framework.

The calculated stress for the framework must be 80 percent or less of the minimum yield stress of the framework material under the dynamic loading conditions that are applied simultaneously.

§ 64.17 Minimum tank thickness.

(a) Except as allowed in paragraph (b) of this section, a tank with a diameter of—

(1) 6 feet or less must have a shell and head of $\frac{3}{16}$ inch thickness or more; or

(2) More than 6 feet must have a shell and head of ¼ inch thickness or more.

(b) If the tank has additional framework to guard against accidental puncturing of the tank, the shell and head thickness must be ⅛ inch or more.

§ 64.19 External pressure.

(a) A tank without a vacuum breaker must be designed to withstand an external pressure of 7½ psig or more.

(b) A tank with a vacuum breaker must be designed to withstand an external pressure of 3 psig or more.

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[1] Listed in Division 1 of Section VIII of the ASME Code, 1974 edition.

§ 64.21 Material.

The material for a tank must meet the requirements in Division 1 of Section VIII of the ASME Code, 1974 edition.

§ 64.23 Gasket and lining.

Each gasket and lining must be made of material that is—

(a) Chemically compatible with the product for which the tank is approved; and

(b) Resistant to deterioration from the product for which the tank is approved.

§ 64.25 Cross section.

A tank must have a cross section design that is—

(a) Circular; or

(b) Other than circular and stress analyzed experimentally by the method contained in UG-101 of the ASME Code, 1974 edition.

§ 64.27 Base.

The base of an MPT must be as wide and as long as the tank.

§ 64.29 Tank saddles.

If a tank is not completely supported by a framework, it must be supported by two or more external saddles, each of which extends to 120 degrees or more of the shell circumference.

§ 64.31 Inspection opening.

An MPT must have an inspection opening that is designed in accordance with Division 1 of Section VIII of the ASME Code, 1974 edition.

§ 64.33 Pipe connection.

Each pipe connection that is not a pressure relief device must be fitted with a manually operated stop valve or closure located as close to the tank as practicable.

§ 64.35 Bottom filling or discharge connection.

If an MPT is designed with a filling or discharge connection in the bottom, the connection must be fitted with a bolted blank flange, threaded cap, or similar device to protect against leakage of the product, and a manually operated valve that is located—

(a) Inside the tank and operated outside the tank; or

(b) Outside the tank but as close to it as practicable.

§ 64.37 Valve and fitting guard.

Each valve and fitting must be protected from mechanical damage by—

(a) The tank;

(b) A tank saddle;

(c) The framework; or

(d) A guard.

§ 64.39 Valve securing device.

Each filling and discharge valve must have a securing device to prevent unintentional opening.

§ 64.41 Stop valve closure.

A stop valve that operates by a screwed spindle must close in a clockwise direction.

§ 64.43 Lifting fittings.

Each MPT must have attached lifting fittings so that the tank remains horizontal and stable while being moved.

§ 64.45 Securing devices.

An MPT or its framework must have sufficient number of positive action securing devices, including hooks, lugs, or padeyes, to attach the unit to the vessel so that—

(a) The stress does not exceed the standard contained in § 64.15; and

(b) Additional lashing is not needed.

§ 64.47 Type of relief devices.

(a) An MPT with an internal capacity of more than 550 U.S. gallons must have one or more spring loaded relief valves. In addition, a rupture disc may be attached.

(b) An MPT with an internal capacity of 550 U.S. gallons or less must have a rupture disc or a spring loaded relief valve.

§ 64.49 Labeling openings.

Each opening of a tank must be labeled to identify the function such as "suction", "discharge", "heating coil".

§ 64.51 Tank parts marking.

Any part of a tank furnished by an outside supplier may not be used in a tank unless it bears—

(a) The Coast Guard symbol;

(b) The Marine Inspection Office identification letters;

(c) The word "part";

(d) The manufacturer's name and serial number; and

(e) The design pressure.

§ 64.53 Metal information plate.

(a) A corrosion resistant metal plate, containing the information in paragraph (b) of this section, must be permanently attached to the tank.

(b) Each metal information plate required in paragraph (a) of this section must have the following information completed in legible letters that are 3/16 inch in height or more:

(1) Owner's name.
(2) Manufacturer's name.
(3) Date of manufacture.
(4) Tank serial number.
(5) Maximum allowable working pressure in psig.
(6) Test pressure in psig.
(7) External pressure in psig rating.
(8) Total capacity in gallons.
(9) Maximum net weight in tons.
(10) Maximum gross weight in tons.
(11) Percent ullage at 122° F.
(12) Hydrostatic test date.

§ 64.55 Relief device location.

A pressure relief device must be located on an MPT in a place that—

(a) Is the highest practical point of the tank; and

(b) Allows direct communication with the vapor space.

Subpart C—Pressure Vacuum Relief Devices

§ 64.57 Pressure relief device acceptance.

A pressure relief device must be—

(a) From a supplier[2] accepted under Chapter I of Title 46, Code of Federal Regulations; or

(b) Accepted by the Coast Guard in accordance with the procedures in § 50.25-10 of this chapter.

§ 64.59 Spring loaded pressure relief valve.

A spring loaded pressure relief valve must—

(a) Be set at a nominal pressure of 125 percent of the maximum allowable working pressure;

(b) Have a minimum normal venting capacity that is sufficient to prevent the tank pressure from exceeding 137.5 percent of the maximum allowable working pressure;

(c) Close after discharge of a pressure not lower than 115 percent of the maximum allowable working pressure; and

(d) If closed, remain closed at any pressure less than 115 percent of the maximum allowable working pressure.

§ 64.61 Rupture disc.

If a rupture disc is the only pressure relief device on the tank, the rupture disc must—

(a) Rupture at a pressure of 125 percent of the maximum allowable working pressure; and

(b) Have a minimum normal venting capacity that is sufficient to prevent the tank pressure from exceeding 137.5 percent of the maximum allowable working pressure.

§ 64.63 Minimum emergency venting capacity.

(a) The total emergency venting capacity (*Q*) of the relief devices of an uninsulated MPT must be in accordance with Table 1 or the following formula based upon the pressure relief device operating at a pressure not to exceed the test pressure:

$$Q=633{,}000(A)^{0.82}\div LC\sqrt{Z^{T}}\div M$$

where:

Q=Minimum required rate of discharge in cubic feet per minute of free air at standard conditions (60° F and 14.7 psia).

M=Molecular weight of the product, or 86.7.

T=Temperature, degrees Rankine (460° + temperature in degrees F of gas at relieving temperature), or 710° Rankine.

A=Total external surface area of the tank compartment in square feet.

L=Latent heat of the product being vaporized at relieving conditions in Btu per pound, or 144 Btu per pound.

Z=Compressibility factor of the gas at relieving conditions, or 1.0.

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[2] Accepted suppliers are listed in CG-190, *Equipment list.*

C=Constant based on relation of specific heats, in accordance with Appendix J of Division 1 of Section VIII of the ASME Code, 1974 edition, or 315.

(b) The total emergency venting capacity (Q) of an insulated portable tank may have a reduction if—

(1) It is shown to the Coast Guard that the insulation reduces the heat transmission to the tank;

(2) The present reduction of the emergency venting capacity (Q) is limited to the percent reduction of the heat transmission to the tank or 50 percent, whichever is less; and

(3) The insulation is sheathed.

TABLE 1.—Minimum emergency venting capacity in cubic feet: free air/hour (14.7 lb/in^2*a and 60° F*)

Exposed area square feet [1]	Cubic feet free air per hour	Exposed area square feet [1]	Cubic feet free air per hour
20	27,600	275	237,000
30	38,500	300	256,000
40	48,600	350	289,500
50	58,600	400	322,100
60	67,700	450	355,900
70	77,000	500	391,000
80	85,500	550	417,500
90	94,800	600	450,000
100	104,000	650	479,000
120	121,000	700	512,000
140	136,200	750	540,000
160	152,100	800	569,000
180	168,200	850	597,000
200	184,000	900	621,000
225	199,000	950	656,000
250	219,500	1,000	685,000

[1] Interpolate for intermediate sizes.

§ 64.65 Vacuum relief device.

A vacuum relief device must—

(a) Open at an external pressure not less than 3 psig; and

(b) Have an opening with a cross section of 0.44 square inches or more.

§ 64.67 Shutoff valve.

A shutoff valve may not be located—

(a) Between the tank opening and pressure relief device; or

(b) On the discharge side of the pressure relief device.

§ 64.69 Location of the pressure relief device.

A pressure relief device must be—

(a) Accessible for inspection and repair before stowage of the tank; and

(b) Attached so that escaping gas does not impinge on the tank or framework.

§ 64.71 Marking of pressure relief devices.

A pressure relief device must be plainly and permanently marked with the—

(a) Set pressure rating;

(b) Rated flow capacity expressed as cubic feet of standard air (60° F. 14.7 psia) per minute and the pressure at which the flow capacity is determined;

(c) Manufacturer's name and identifying number; and

(d) Pipe size of inlet.

Subpart D—Shop Inspection

§ 64.73 Request for shop inspection.

(a) After the information required in § 64.7 is approved by the Coast Guard, the manufacturer must request a shop inspection and hydrostatic test for each MPT from the cognizant Officer in Charge, Marine Inspection.

(b) If a shop inspection and hydrostatic test for an MPT cannot be performed within a reasonable time, the Officer in Charge, Marine Inspection may accept the manufacturer's certification that the MPT meets the requirements in Subpart B of this part. However, this MPT must pass a hydrostatic test in the presence of a Coast Guard inspector before it may be stamped in accordance with § 64.75.

§ 64.75 Stamping.

If an MPT conforms to the approved plan and passes a hydrostatic test required in § 54.10-10 of this chapter, a Coast Guard inspector stamps on the metal information plate required in § 64.53 the—

(a) Coast Guard symbol, in accordance with § 50.10-25 of this chapter; and

(b) Coast Guard number, in accordance with § 50.10-30 of this chapter.

Subpart E—Periodic Inspections and Tests

§ 64.77 Inspection and test.

For the handling and stowage requirements in § 98.30-3 of this chapter, each portable tank must pass the following inspections and tests conducted by the owner or his representative:

(a) Pressure relief and vacuum relief devices must be inspected one time or more during each 12 month period of service in accordance with § 64.79.

(b) An MPT must be inspected during the 30 months before any month in which it is in service in accordance with § 64.81.

(c) An MPT must pass a hydrostatic test in accordance with § 64.83 during the 60 months before any month in which it is in service.

(d) After each welded repair, an MPT must pass a hydrostatic test in accordance with § 64.83.

§ 64.79 Inspection of pressure and vacuum relief device.

(a) The inspection of the pressure and vacuum relief device required in § 64.77(a) must include—

(1) Disassembling;

(2) A visual inspection for defective parts; and

(3) A test of the accuracy of the pressure setting.

(b) If the pressure and vacuum relief valve passes the inspection required in paragraph (a) of this section, the owner or his representative may attach to the device a metal tag containing the date of the inspection.

§ 64.81 30-month inspection of an MPT.

(a) The 30-month inspection of an MPT required in § 64.77(b) must include—

(1) An internal and external examination for—

(i) Corrosion;

(ii) Cracking of base material; and

(iii) Weld defects; and

(2) A visual inspection for defective parts and a manual operation of the gauging device, remote operating mechanism, and each valve, except the pressure relief device.

(b) If the tank passes the inspection required in paragraph (a) of this section, the owner or his representative may stencil the date of the inspection on the MPT near the metal identification plate that is required in § 64.53 in durable and legible letters that are 1¼ inch in height or larger.

§ 64.83 Hydrostatic test.

(a) The hydrostatic test required in § 64.77(c) includes—

(1) Closing each manhole and other openings by normal means of closure;

(2) Using wrenches or other tools that are used during normal operations to close the manhole and other openings;

(3) Using the same type of gaskets as used in service;

(4) If required for the inspection, removing tank insulation;

(5) Filling the tank with water and pressurizing to the test pressure indicated on the metal identification plate without leaking; and

(6) It fitted with an internal heating coil, the heating coil passing a hydrostatic test at a pressure of 200 psig or more or 50 percent or more above the rated pressure of the coil, whichever is greater.

(b) If the tank passes the hydrostatic test required in paragraph (a) of this section, the owner or his representative may stamp the date of the test and his initials on the metal identification plate required in § 64.53.

§ 64.85 Portable tanks constructed before October 1, 1974.

(a) If a portable tank is constructed, maintained, marked, and inspected in accordance with Subpart 98.35 of this chapter, it may carry combustible liquids until October 1, 1984.

(b) If a portable tank does not meet the requirements in paragraph (a) of this section or the requirements in this Part, it may carry a dangerous article or combustible liquid until October 1, 1977 if—

(1) The owner, lessee, charterer, or person in charge submits in accordance with § 50.20-5 of this chapter—

(i) The date and place of manufacture;

(ii) The portable tank's serial number;

(iii) The design drawing and calculation;

(iv) The type, manufacturer, and setting of each relief device;

(v) The dangerous article or combustible liquid proposed to be carried in the portable tank; and

(vi) A history of the portable tank's service; and

(2) The information submitted in accordance with paragraph (b)(1) of this section, is accepted by the Coast Guard;

(3) The portable tank passes a Coast Guard inspection to determine conformance with the accepted information; and

(4) The Coast Guard notifies the owner in writing that the portable tank is accepted and may continue in service until October 1, 1977. If allowed to remain in service, the owner may complete and mark on the accepted portable tank in letters 3 inches in height or larger:

LIMITED FOR

(*dangerous article or combustible liquid accepted for carriage*)

UNTIL October 1, 1977

(c) An appeal from the decision required in paragraph (b)(2) of this section may be made in accordance with § 50.20-40 of this chapter.

Subpart F—Cargo Handling System

§ 64.87 Purpose.

Each cargo handling system required to meet § 98.30-25 of this chapter must meet the requirements of this subpart.

§ 64.89 Cargo pump unit.

(a) A cargo pump unit that fills or discharges a portable tank must be—

(1) Constructed of materials that are compatible with the product to be pumped; and

(2) Designed to be compatible with the hazard associated with the product to be pumped.

(b) The cargo pump power unit must be—

(1) Diesel;

(2) Hydraulic;

(3) Pneumatic; or

(4) Electric.

(c) The starting system for a cargo pump power unit must be designed to be compatible with the hazard associated with the product to be pumped.

(d) A diesel engine that is used to drive a cargo pump must have a spark arrestor on the exhaust system.

§ 64.91 Relief valve for the cargo pump discharge.

The cargo pump discharge must have a relief valve that is—

(a) Fitted between the cargo pump discharge and the shut-off valve, with the relief valve discharge piped back to the cargo pump suction or returned to the tank; and

(b) Set at the maximum design pressure of the piping and discharge hose, or less.

§ 64.93 Pump controls.

(a) A pressure gauge must be installed—

(1) On the pump discharge;

(2) Near the pump controls; and

(3) Visible to the operator.

(b) A pump must have a remote, quick acting, manual shutdown that is conspicuously labeled and located in an easily accessible area away from the pump. The quick acting, manual shutdown for remote operation must provide a means of stopping the pump power unit.

§ 64.95 Piping.

(a) Piping, valves, flanges, and fittings used in the pumping system must be designed in accordance with Part 56 of this chapter.

(b) A cargo loading and discharge header or manifold must—

(1) Have stop valves to prevent cargo leakage; and

(2) Be visible to the operator at the cargo pump controls.

(c) Each pipe and valve in the pumping system that has an open end must have a plug or cap to prevent leakage.

(d) Each hose connection must be threaded or flanged except for a quick connect coupling that may be specifically accepted by the U.S. Coast Guard in accordance with the procedures in § 50.25-15 of this chapter.

(e) A non-return valve must be in the pump discharge if a backflow condition may occur during pumping.

(f) Any non-metallic flexible hose that is used in the piping system must comply with § 56.60–25(c) of this chapter.

§ 64.97 Cargo hose.

Each hose assembly, consisting of couplings and a hose that has an inside diameter—

(a) Larger than three inches, must meet the requirements in 33 CFR 154.500; or

(b) Three inches or less, must be designed to withstand the pressure of the shutoff head of the cargo pump or pump discharge relief valve setting, but not less than 100 pounds per square inch.

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SUBCHAPTER G—DOCUMENTATION AND MEASUREMENT OF VESSELS

PART 66—GENERAL PROVISIONS

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Subpart 66.05—Ports of Documentation

66.05-1 Ports of documentation.

AUTHORITY: Secs. 2, 3, 23 Stat. 118, as amended, 119, as amended, sec. 3, 70 Stat. 544, sec. 30, subsec. W, 41 Stat. 1006, sec. 6(b)(1), 80 Stat. 937; 46 U.S.C. 2, 3, 883b, 983, 49 U.S.C. 1655(b)(1); 49 CFR 1.46(b) and (d) (35 FR 4959), unless otherwise noted.

SOURCE: CGFR 69-138, 34 FR 20104, Dec. 23, 1969, unless otherwise noted.

Subpart 66.01—Authority and Purpose

§ 66.01-1 Purpose of regulations.

The purpose of the regulations in this subchapter is to provide for:

(a) Documentation of vessels under the laws of the United States.

(b) Recordation of bills of sale and conveyances, preferred mortgages, related instruments, ordinary mortgages, releases, satisfactions, assignments, hypothecations, and similar instruments concerning vessel transactions.

(c) Registration of private signals, funnel marks, and house flags.

(d) Measurement of vessels.

§ 66.01-3 Assignment of functions.

(a) The Secretary of the Treasury by an order dated January 30, 1967, and effective February 24, 1967 (32 FR 2463), delegated to the Commandant, U.S. Coast Guard, certain functions that the Commissioner of Customs had been authorized to perform under prior delegations of authority and included those functions pertaining to admeasurement of vessels, documentation of vessels, preparation and publication of the register of merchant vessels of the United States, and registration of stack insignia.

(b) The Commandant, U.S. Coast Guard, in a notice dated March 15, 1967 (32 FR 4365) approved the continuation of all orders, determinations, rules, regulations, directives, requirements, standards, statements of policy, notices, interpretations, procedures, documents, registers, licenses, enrollments, certifications, permits, privileges, exemptions, waivers, and all other actions which had been issued, made, granted, or allowed to become effective prior to February 24, 1967, and provided that they should continue in effect according to their terms until modified, terminated, repealed, superseded, or set aside by appropriate authority.

(c) The Department of Transportation Act (Pub. L. 89-670, 80 Stat. 931-950, 49 U.S.C. 1651-1659), transferred to and vested in the Secretary of Transportation "* * * all functions, powers, and duties, relating to the Coast Guard, of the Secretary of the Treasury and of other officers and offices of the Department of the Treasury".

(d) By a rule in 49 CFR 1.4(a)(2) the Secretary of Transportation, among other things, delegated to the Commandant, U.S. Coast Guard the authority to exercise the functions, powers and duties pertaining to the admeasurement and documentation of vessels, the preparation and publication of merchant vessel registers, and the registration of stack insignia.

(e) The Commandant, U.S. Coast Guard, in a notice dated March 31, 1967 (32 FR 5611), approved the continuation of orders, rules, regulations, policies, procedures, privileges, waivers, and other actions, which had been made, allowed, granted, or issued prior to April 1, 1967, and provided that they should continue in effect according to their terms until modified, terminated, repealed, superseded, or set aside by appropriate authority.

(f) By Reorganization Plan No. 1 of 1967 (32 FR 7049), effective May 9, 1967, the functions vested in the Secretary of Commerce relating to the approval of the surrender of the documents of a vessel pursuant to subsections B(4) and O(a) of the Ship Mortgage Act, 1920, as amended (46 U.S.C. 911(4) and 961(a)), were transferred to the Secretary of Transportation.

(g) By a rule in 49 CFR 1.4(a)(4) the Secretary of Transportation delegated to the Commandant, U.S. Coast Guard, authority to exercise certain functions, powers, and duties as set forth in Reorganization Plan No. 1 of 1967.

(h) The Commandant, U.S. Coast Guard, in a notice dated June 16, 1967, and effective as of May 9, 1967 (32 FR 8980), adopted and affirmed, except as modified, terminated, or superseded by such notice, all orders, determinations, rules, regulations, directives, requirements, standards, statements of policy, notices, interpretations, procedures, documents, certifications, privileges, and exemptions which had been issued, made, granted, or allowed prior to May 9, 1967.

Subpart 66.03—Definitions of Terms Used in This Subchapter

§ 66.03-1 Commandant.

This term means the Commandant of the U.S. Coast Guard.

§ 66.03-3 Officer in Charge, Marine Inspection (OCMI).

This term means any person from the civilian or military branch of the Coast Guard designated as the Officer in Charge of a Marine Inspection Zone by the Commandant.

§ 66.03-5 Vessel.

This term includes every description of watercraft or other contrivance used or capable of being used as a means of transportation on water, but does not include aircraft.

(61 Stat. 633, sec. 401, 46 Stat. 708, as amended, sec. 1109, 72 Stat. 799, as amended; 1 U.S.C. 3, 19 U.S.C. 1401, 49 U.S.C. 1509)

§ 66.03-7 Vessel of the United States.

This term means any vessel documented under the laws of the United States.

(Sec. 30, subsec. B, 41 Stat. 1000, as amended; 46 U.S.C. 911)

§ 66.03-9 Documented.

This term means registered, enrolled and licensed, or licensed under the laws of the United States, whether permanently or temporarily.

§ 66.03-11 Marine documents.

This term includes registry, enrollment and license, and license.

§ 66.03-13 Port of documentation.

This term means the home port of a vessel. It does not include a port in which a temporary document is issued.

(R.S. 4141, sec. 30, subsec. B, 41 Stat. 1000, as amended, sec. 4, 43 Stat. 948; 46 U.S.C. 17, 911, 1011)

§ 66.03-15 Mortgagee.

This term, in the case of a mortgage involving a trust deed and a bond issue thereunder, means the trustee designated in such deed.

(Sec. 30, subsec. B, 41 Stat. 1000, as amended; 46 U.S.C. 911)

§ 66.03-17 Parent corporation.

This term means a corporation incorporated under the laws of the United States, or any State, Territory, District, or possession thereof, which controls, directly or indirectly, at least 50 percent of the voting stock of a corporation which is a citizen of the United States as defined in § 67.03-7(a) of this chapter and for which there is no file with the proper Officer in Charge a valid and current certificate under oath as required by § 67.23-13 of this chapter.

(Sec. 27A, 72 Stat. 1736; 46 U.S.C. 883-1)

[CGFR 69-138, 34 FR 20104, Dec. 23, 1969; 35 FR 1104, Jan. 28, 1970]

§ 66.03-19 Subsidiary corporation.

This term means a corporation incorporated under the laws of the United States, or any State, Territory, District, or possession thereof, not less than 50 percent of the voting stock of which is controlled, directly or indirectly, by a corporation which is a citizen of the United States as defined in § 67.03-7(a) of this chapter or by its parent and for which there is on file with the proper Officer in Charge a valid and current certificate under oath as required by § 67.23-13 of this chapter.

(Sec. 27A, 72 Stat. 1736; 46 U.S.C. 883-1)

Subpart 66.05—Ports of Documentation

§ 66.05-1 Ports of documentation.

The following is a list of Coast Guard Districts and Marine Inspection Zones indicating the ports of documentation within each District and Zone. The territorial limits of Coast Guard Districts and Marine Inspection Zones are defined in 33 CFR Part 3.

Coast Guard districts	Marine inspection zones	Ports of documentation
First	Boston	Boston, Mass.
		Gloucester, Mass.
		Plymouth, Mass.
		Salem, Mass.
	Portland, Maine	Bangor, Maine.
		Bar Harbor, Maine.
		Bath, Maine.
		Belfast, Maine.
		Calais, Maine.
		Eastport, Maine.
		Jonesport, Maine.
		Portland, Maine.
		Portsmouth, N.H.
		Rockland, Maine.
	Providence	Fall River, Mass.
		New Bedford, Mass.
		Newport, R.I.
		Providence, R.I.
Second	St. Louis	St. Louis, Mo.
	Cincinnati	Cincinnati, Ohio.
	Dubuque	Minneapolis, Minn.
	Louisville	Evansville, Ind.
		Louisville, Ky.
	Memphis	Greenville, Miss.
		Memphis, Tenn.
	Nashville	Nashville, Tenn.
	Pittsburgh	Pittsburgh, Pa.
Third	New York	Bridgeport, Conn.
		Hartford, Conn.
		New Haven, Conn.
		New London, Conn.
		New York, N.Y.
		Perth Amboy, N.J.
	Albany	Albany, N.Y.
	Philadelphia	Philadelphia, Pa.
		Wilmington, Del.
Fifth	Portsmouth	Cape Charles, Va.
		Elizabeth City, N.C.
		Norfolk, Va.
		Reedville, Va.
	Baltimore	Baltimore, Md.
		Cambridge, Md.
		Crisfield, Md.
		Washington, D.C.
	Wilmington	Beaufort-Morehead City, N.C.
		Washington, N.C.
		Wilmington, N.C.
Seventh	Miami	Key West, Fla.
		Miami, Fla.
		West Palm Beach, Fla.
	Charleston	Charleston, S.C.
	Jacksonville	Jacksonville, Fla.
	San Juan	Charlotte Amalie, St. Thomas, V.I.
		San Juan, P.R.
	Savannah	Brunswick, Ga.
		Savannah, Ga.
	Tampa	Tampa, Fla.
Eighth	New Orleans	Baton Rouge, La.
		Houma, La.
		Morgan City, La.
		New Orleans, La.
	Corpus Christi	Brownsville, Tex.
		Corpus Christi, Tex.
	Galveston	Galveston, Tex.
	Houston	Houston, Tex.
	Mobile	Apalachicola, Fla.
		Biloxi, Miss.
		Mobile, Ala.
		Pensacola, Fla.
	Port Arthur	Lake Charles, La.
		Port Arthur, Tex.
Ninth	Cleveland	Cleveland, Ohio.
	Buffalo	Buffalo, N.Y.
		Erie, Pa.
		Ogdensburg, N.Y.
		Oswego, N.Y.
		Rochester, N.Y.
	Chicago	Chicago, Ill.
		Milwaukee, Wis.
		Muskegon, Mich.
	Detroit	Detroit, Mich.
		Port Huron, Mich.
	Duluth	Duluth, Minn.
	St. Ignace	Sault Ste. Marie, Mich.
	Toledo	Sandusky, Ohio.
		Toledo, Ohio.
Eleventh	Los Angeles-Long Beach	Los Angeles-Long Beach, Calif.
	San Diego	San Diego, Calif.
Twelfth	San Francisco	Eureka, Calif.
		San Francisco, Calif.

Coast Guard districts	Marine inspection zones	Ports of documentation
Thirteenth	Seattle.	Bellingham, Wash.
		Port Angeles, Wash.
		Port Townsend, Wash.
		Seattle, Wash.
		Tacoma, Wash.
		Aberdeen, Wash.
	Portland, Oreg	Astoria, Oreg.
		Coos Bay, Oreg.
		Portland, Oreg.
Fourteenth	Honolulu.	Honolulu, Hawaii.
	Guam.	Guam.
Seventeenth	Southeast Alaska.	Juneau, Alaska.
		Ketchikan, Alaska.
	Western Alaska	Anchorage, Alaska.

(Sec. 1, 43 Stat. 947, as amended; 14 U.S.C. 633, 46 U.S.C. 18; 23 Stat. 118 (46 U.S.C. 2); 80 Stat. 937 (49 U.S.C. 1611(b)(1)); 46 CFR 67.23-11; 49 CFR 1.46(b))

[CGFR 69-138, 34 FR 20104, Dec. 23, 1969, as amended by CGFR 70-20, 35 FR 4517, Mar. 13, 1970; CGFR 70-62, 35 FR 7651, May 16, 1970; CGD 72-39R, 37 FR 14584, July 21, 1972; CGD 72-75R, 37 FR 26600, Dec. 14, 1972; CGD 72-174R, 37 FR 26601, Dec. 14, 1972; CGD 75-158, 40 FR 50035, Oct. 28, 1975; OGD 80-063, 45 FR 41429, June 19, 1980]

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AUTHORITY: Secs. 2, 3, 23 Stat. 118, as amended, 119, as amended, sec. 1, 38 Stat. 1193, as amended, R.S. 4166, as amended, R.S. 4177, as amended, sec. 2, 41 Stat. 437, as amended, R.S. 4150, as amended, R.S. 4153, as amended, R.S. 4214, as amended, R.S. 4215, sec. 1, 34, Stat. 136, as amended, R.S. 4336, as amended, sec. 3, 70 Stat. 544, sec. 30, subsec. W, 41 Stat. 1006, as amended, sec. 6(b)(1), 80 Stat. 937, sec. 3, 68 Stat. 675; 46 U.S.C. 2, 3, 12, 35, 45, 52, 74, 77, 103, 109, 260, 277, 883b, 983, 49 U.S.C. 1655(b)(1), 50 U.S.C. 198; 49 CFR 1.46 (b) and (d) (35 FR 4959), unless otherwise noted.

SOURCE: CGFR 69-138, 34 FR 20105, Dec. 23, 1969, unless otherwise noted.

Subpart 67.01—Vessels Entitled to, Exempt From, and Subject to Documentation

§ 67.01-1 Vessels entitled to marine documents.

(a) A vessel of 20 net tons or more may be registered or enrolled and licensed. A vessel of 5 net tons or more but less than 20 net tons may be licensed (except vessels subject to the provisions of paragraph (b) of this section) or registered.

(b) Any vessel of 5 net tons or more which is to be documented for navigating the waters of the northern, northeastern, or northwestern frontiers otherwise than by sea shall be granted a frontier enrollment and license, Form CG-1273, except that a vessel used exclusively as a pleasure vessel on those waters may be granted an enrollment and license as a yacht, Form CG-1290, if entitled to be so documented in accordance with the provisions of § 67.01-3. (See Subpart 67.61.)

§ 67.01-3 Yachts entitled to marine documents.

(a) Any vessel, other than one navigating the waters of the northern, northeastern, or northwestern frontiers otherwise than by sea, may be licensed as a yacht if under 20 but not under 5 net tons and used exclusively as a pleasure vessel, and if otherwise entitled to be documented.

(b) Any vessel may be enrolled and licensed as a yacht if used exclusively as a pleasure vessel and otherwise entitled to be documented, provided it is of 5 net tons or over in the case of a vessel navigating the waters of the northern, northeastern, or northwestern frontiers otherwise than by sea, or 20 net tons or over in any other case.

(R.S. 4214, as amended; 46 U.S.C. 103)

§ 67.01-5 Classes of vessels entitled to marine documents.

The following classes of vessels are entitled to receive marine documents under existing laws:

(a) *Class 1.* Any vessel built in the United States and wholly owned by a citizen (for the meaning of the word "citizen" in this section, see subpart 67.03). A vessel of this class owned by a corporation which is qualified as a citizen of the United States under the definition contained in § 67.03-7(a) may be documented for use in the coastwise trade within the limitations specified in the Act of September 2, 1958 (46 U.S.C. 883-1), if it is a non-self-propelled vessel or a self-propelled vessel of less than 500 gross tons (see also § 67.03-7(b)).

(b) *Class 2.* Any vessel purchased from the Maritime Administration or

War Shipping Administration by a citizen. (See § 67.63-9(c).)

(c) *Class 3.* Any vessel built in the United States in whole or in part for the account of one who is not a citizen and then recorded, which thereafter becomes wholly owned by a citizen and has never before been documented. (See Subpart 67.69.)

(d) *Class 4.* Any vessel captured by a citizen in a war to which the United States is a party, which has been lawfully condemned as a prize and is wholly owned by a citizen.

(e) *Class 5.* Any vessel which has been judicially forfeited for a breach of the laws of the United States when wholly owned by a citizen. This includes a foreign-built vessel, but does not include any vessel not otherwise entitled to documents which has been sold under a decree of admiralty for debt or seamen's wages.

(f) *Class 6.* Any vessel built in the United States and sold by the Government to a citizen. A foreign-built vessel bought or chartered by the Government is entitled to documentation if sold to a citizen and the requirements for class 9 are met.

(g) *Class 7.* Any vessel authorized by special act of Congress to be documented.

(h) *Class 8.* Any vessel wrecked on a coast of the United States or its possessions or in adjacent waters when purchased by a citizen and repaired in a shipyard in the United States or its possessions, provided it be proved to the satisfaction of the Commandant, through a board of three appraisers appointed by him if necessary, that the repairs put upon such vessel are equal to three times the appraised salved value of the vessel. The expense of such appraisal shall be borne by the owner of the vessel. If any of the material facts sworn to or represented by the owner, or at his instance, to obtain a marine document for such vessel is not true, the vessel is liable to forfeiture.

(i) *Class 9.* Any seagoing vessel, whether steam or sail, wherever built, wholly owned by a citizen. A foreign-built vessel of this class shall engage only in trade with foreign countries or the islands of Guam, Tutila, Wake, Midway, or Kingman Reef. It shall not engage in the coastwise trade, except as specified in sections 18 and 22, Merchant Marine Act, 1920, as amended, nor in the American fisheries. (See Subpart 67.63.)

(R.S. 4132, as amended, sec. 22, 41 Stat. 997, R.S. 4136, as amended, R.S. 4214, as amended, sec. 9, 39 Stat. 730, as amended, sec. 27, 41 Stat. 999, as amended, sec. 27A, 72 Stat. 1736, secs. 2, 3, 70 Stat. 544, as amended; 46 U.S.C. 11, 13, 14, 103, 808, 883, 883-1, 883a, 883b)

§ 67.01-7 Notation on the marine document of a vessel owned by a corporation.

(a) The appropriate one of the following notations shall be made on the register of any vessel owned by a corporation which is established as a citizen of the United States under the definition contained in § 67.03-5 (a) or (b), except when such register is required by any other provision of this part to bear an endorsement prohibiting the vessel from engaging in the coastwise trade:

(1) "Less than 75 percent of the interest in the corporation owning this vessel is owned by citizens of the United States. It shall not engage in the coastwise trade"; or

(2) "75 percent of the interest in the corporation owning this vessel is owned by citizens of the United States. It may engage in the coastwise trade so long as so owned and no longer."

(b) The following notation shall be made on the enrollment and license or license of any non-self-propelled vessel or any self-propelled vessel of less than 500 gross tons owned by a corporation which is established as a citizen of the United States under the definition contained in § 67.03-7(a):

As amended by the Act of September 2, 1958 (46 U.S.C. 883-1). This vessel may engage in the coastwise trade, within the limitations specified in the Act, so long as so owned and no longer. It shall not engage in the fisheries and is not authorized to be documented for nor to engage in the foreign trade.

(Sec. 2, 39 Stat. 729, as amended, sec. 3, 70 Stat. 544, sec. 27A, 72 Stat. 1736; 46 U.S.C. 802, 883b, 883-1)

§ 67.01-9 Loss of coastwise privileges; notation on marine document.

(a) No vessel of classes 1 through 8 (§ 67.01-5 (a) through (h)) which has acquired the lawful right to engage in the coastwise trade by virtue of having been built in or documented under the laws of the United States, shall have the right to engage in such trade if it thereafter has been sold or transferred foreign in whole or in part or placed under foreign registry (Subpart 67.65), or, if of more than 500 gross tons, has been rebuilt unless the entire rebuilding, including the construction of any major components of the hull or superstructure of the vessel, was effected within the United States, its territories (not including trust territories), or its possessions. However, no rebuilt vessel shall be deemed to have lost its coastwise privileges within the meaning of the above merely because it may have been rebuilt within the United States, its Territories (not including trust territories), or its possessions under a contract executed before July 5, 1960, if the work of rebuilding is commenced not later than 24 months after such date (Subpart 67.37).[1]

(b) When a vessel has lost its coastwise privileges, no marine document shall be issued for the coastwise trade and any marine document which may be issue to such vessel for any other trade or employment shall bear the following notation:

As amended by section 27 of the Merchant Marine Act of June 5, 1920, as amended. This vessel shall not engage in the coastwise trade. (Sec. 27, 41 Stat. 999, as amended, secs. 2, 3, 70 Stat. 544, as amended; 46 U.S.C. 883, 883a, 883b)

§ 67.01-11 Vessels exempt from documentation.

(a) The following classes of vessels are exempt from documentation:

(1) Boats or lighters not masted, or masted but not decked, used in the harbor of any town or city, and not carrying passengers.

(2) Canal boats, barges, or other boats used in whole or in part on canals or on the internal waters of a State, without sail or internal motive power of their own, not engaged in trade with contiguous foreign territory, and not carrying passengers.

(3) Barges or boats without sail or internal motive power of their own plying in whole or in part on inland rivers or lakes of the United States, not engaged in trade with contiguous foreign territory, and not carrying passengers.

(4) Vessels plying upon waters which are wholly within the limits of a State and which have no outlet into a river or lake on which commerce with foreign nations or among the States can be carried on.

(5) Vessels of less than 5 net tons.

(b) No vessel exempt from documentation under the provisions of paragraph (a) (1), (2), (3), or (5) of this section and owned by a corporation which is a citizen of the United States as defined in § 67.03-7(a) shall be operated in trade on the navigable waters of the United States unless there is on file with the Officer in Charge for the marine inspection zone in which the vessel business of the owner is conducted a valid and current certificate under oath on Form CG-1260 as required by § 67.23-7(a).

(Sec. 7, 24 Stat. 81, as amended, 21 Stat. 44, R.S. 4385, 18 Stat. 31, 72 Stat. 1736; 46 U.S.C. 319, 332, 335, 336, 883-1)

§ 67.01-13 Vessels subject to documentation.

All vessels, except vessels exempt from documentation under the provisions of § 67.01-11, engaged in trade between ports in the United States or engaged in the fisheries, if not registered, shall be enrolled and licensed, or licensed, or will be liable to a penalty of $30 on every arrival, unless the vessel has not been within a marine inspection zone since the expiration of the license.

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[1] "* * * (Sec. 1) * * * the second proviso of section 27 of the Merchant Marine Act, 1920, as amended (U.S.C., 1958 edition, title 46, sec. 883), is amended to read as follows: 'Provided further, That no vessel of more than five hundred gross tons which has acquired the lawful right to engage in the coastwise trade, by virtue of having been built in or documented under the laws of the United States, and which has later been rebuilt, shall have the right thereafter to engage in the coastwise trade, unless the entire rebuilding, including the construction of any major components of the hull or superstructure of the vessel, is effected within the United States, its Territories (not including trust territories), or its possessions' * * *" (Sec. 1, Act of July 5, 1960 (74 Stat. 321).)

(Sec. 7, 34 Stat. 81, as amended; 46 U.S.C. 319)

Subpart 67.03—Citizenship

§ 67.03-1 Individual.

The term "citizen", in the case of an individual, means a native-born, derivative or naturalized citizen of the United States.

(R.S. 4132, as amended, 4131, as amended, sec. 9, 39 Stat. 730, as amended, sec. 4, 40 Stat. 901, as amended; 46 U.S.C. 11, 221, 808, 835)

§ 67.03-3 Partnership, unincorporated company, or association.

(a) The term "citizen," in the case of a partnership, unincorporated company, or association, means one whose members are all citizens of the United States.

(b) A vessel, although owned by a partnership or association which is a citizen as defined in section 2 of the Shipping Act, 1916, as amended,[2] shall not be documented as a vessel of the United States unless the owner is also a citizen as defined in paragraph (a) of this section.

(R.S. 4132, as amended, 4131, as amended, secs. 2, 9, 39 Stat. 729, as amended, 730, as amended, sec. 4, 40 Stat. 901, as amended; 46 U.S.C. 11, 221, 802, 808, 835)

§ 67.03-5 Corporation.

(a) The term "citizen," in the case of a corporation, means one which is incorporated under the laws of the United States, or of any State thereof, of which the president or other chief executive officer, and the chairman of the board of directors are citizens of the United States, so long as no more of its directors than a minority of the number necessary to constitute a quorum shall be noncitizens.

(b) A vessel, although owned and documented by a corporation which is a citizen as defined in paragraph (a) of this section, shall not engage in the coastwise trade unless 75 percent of the interest in the corporation is owned by citizens as specified in section 2 of the Shipping Act, 1916, as amended.[2]

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[2] "(a) Within the meaning of this chapter no corporation, partnersip, or association shall be deemed a citizen of the United States unless the controlling interest therein is owned by citizens of the United States, and, in the case of a corporation, unless its president or other chief executive officer and the chairman of its board of directors are citizens of the United States and unless no more of its directors than a minority of the number necessary to constitute a quorum are noncitizens and the corporation itself is organized under the laws of the United States or of a State, Territory, District, or possession thereof, but in the case of a corporation, association, or partnership operating any vessel in the coastwise trade the amount of interest required to be owned by citizens of the United States shall be 75 per centum.

"(b) The controlling interest in a corporation shall not be deemed to be owned by citizens of the United States (a) if the title to a majority of the stock thereof is not vested in such citizens free from any trust or fiduciary obligation in favor of any person not a citizen of the United States; or (b) if the majority of the voting power in such corporation is not vested in citizens of the United States; or (c) if through any contract or understanding it is so arranged that the majority of the voting power may be exercised, directly or indirectly, in behalf of any person who is not a citizen of the United States; or, (d) if by any other means whatsoever control of the corporation is conferred upon or permitted to be exercised by any person who is not a citizen of the United States.

"(c) Seventy-five per centum of the interest in a corporation shall not be deemed to be owned by citizens of the United States (a) if the title to 75 per centum of its stock is not vested in such citizens free from any trust or fiduciary obligation in favor of any person not a citizen of the United States; or (b) if 75 per centum of the voting power in such corporation is not vested in citizens of the United States; or (c) if, through any contract or understanding, it is so arranged that more than 25 per centum of the voting power in such corporation may be exercised, directly or indirectly, in behalf of any person who is not a citizen of the United States; or (d) if by any other means whatsoever control of any interest in the corporation in excess of 25 per centum is conferred upon or permitted to be exercised by any person who is not a citizen of the United States." (46 U.S.C. 802.)

(c) A vessel, although owned by a corporation which is not a citizen as defined in section 2 of the Shipping Act, 1916, as amended, may be documented as a vessel of the United States if the sale or transfer to the corporation was not in violation of section 9 or 37 of the Shipping Act, 1916, as amended (46 U.S.C. 808, 835), and if the corporation is a citizen as defined in paragraph (a) of this section.

(R.S. 4132, as amended, 4131, as amended, secs. 2, 9, 39 Stat. 729, as amended, 730, as amended, sec. 4, 40 Stat. 901, as amended; 46 U.S.C. 11, 221, 802, 808, 835)

§ 67.03-7 Corporation qualifying under the Act of September 2, 1958.

(a) The term "citizen," in the case of a corporation owning and operating a non-self-propelled vessel, or a self-propelled vessel of less than 500 gross tons, or in the case of a corporation which seeks to qualify as a citizen under the Act of September 2, 1958 (46 U.S.C. 883-1), for any purpose under the Act, means one which is incorporated under the laws of the United States, or any State, Territory, District, or possession thereof provided that (1) a majority of the officers and directors of such corporation are citizens of the United States; (2) not less than 90 percent of the employees of such corporation are residents of the United States; (3) such corporation is engaged primarily in a manufacturing or mineral industry in the United States or any Territory, District, or possession thereof; (4) the aggregate book value of the vessels owned by such corporation does not exceed 10 percent of the aggregate book value of the assets of such corporation; and (5) such corporation purchases or produces in the United States, its Territories, or possessions not less than 75 percent of the raw materials used or sold in its operations, and provided further that a certificate under oath on Form CG-1260 as prescribed in Subpart 67.23 is filed with the Officer in Charge concerned as provided therein, if any, or if none, with the Commandant, together with the required certificate as to the organization of the corporation and the names of all officers and directors of the corporation, showing the home address and citizenship of each.[3]

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[3] "Notwithstanding any other provision of law, a corporation incorporated under the laws of the United States or any State, Territory, District, or possession thereof, shall be deemed to be a citizen of the United States for the purposes of and within the meaning of that term as used in sections 316, 808, 835 and 883 of this title, and the laws relating to the documentation of vessels, if it is established by a certificate filed with the Secretary of the Treasury [now, Secretary of Transportation] as hereinafter provided, that—

"(a) A majority of the officers and directors of such corporation are citizens of the United States;

"(b) Not less than 90 per centum of the employees of such corporation are residents of the United States;

"(c) Such corporation is engaged primarily in a manufacturing or mineral industry in the United States or any Territory, District, or possession thereof;

"(d) The aggregate book value of the vessels owned by such corporation does not exceed 10 per centum of the aggregate book value of the assets of such corporation; and

"(e) Such corporation purchases or produces in the United States, its Territories, or possessions not less than 75 per centum of the raw materials used or sold in its operations but no vessel owned by any such corporation shall engage in the fisheries or in the transportation of merchandise or passengers for hire between points in the United States, including Territories, Districts, and possessions thereof, embraced within the coastwise laws, except as a service for a parent or subsidiary corporation and except when such vessel is under demise or bareboat charter at prevailing rates for use otherwise than in the domestic noncontiguous trades from any such corporation to a common or contract carrier subject to chapter 12 of Title 49, which otherwise qualifies as a citizen under section 802 of this title, and which is not connected, directly or indirectly, by way of ownership or control with such corporation.

"As used herein (1), the term 'parent' means a corporation which controls, directly or indirectly, at least 50 per centum of the voting stock of such corporation, and (2), the term 'subsidiary' means a corporation not less than 50 per centum of the voting stock of which is controlled, directly or indirectly, by such corporation or its parent, but no corporation shall be deemed to be a 'parent' or 'subsidiary' hereunder unless it is incorporated under the laws of the United States, or any State, Territory,

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District, or possession thereof, and there has been filed with the Secretary of the Treasury [now Secretary of Transportation] a certificate as hereinafter provided.

"Vessels built in the United States and owned by a corporation meeting the conditions hereof which are non-self-propelled or which, if self-propelled, are of less than five hundred gross tons shall be entitled to documentation under the laws of the United States, and except as restricted by this section, shall be entitled to engage in the coastwise trade and, together with their owners or masters, shall be entitled to all the other benefits and privileges and shall be subject to the same requirements, penalties, and forfeitures as may be applicable in the case of vessels built in the United States and otherwise documented or exempt from documentation under the laws of the United States.

"A corporation seeking hereunder to document a vessel under the laws of the United States or to operate a vessel exempt from documentation under the laws of the United States shall file with the Secretary of the Treasury of the United States [now Secretary of Transportation] a certificate under oath, in such form and at such times as may be prescribed by him, executed by its duly authorized officer or agent, establishing that such corporation complies with the conditions of this section above set forth. A 'parent' or 'subsidiary' of such corporation shall likewise file with the Secretary of the Treasury [now Secretary of Transportation] a certificate under oath, in such form and at such time as may be prescribed by him, executed by its duly authorized officer or agent, establishing that such 'parent' or 'subsidiary' complies with the conditions of this section above set forth, before such corporation may transport any merchandise or passengers for such parent or subsidiary. If any material matter of fact alleged in any such certificate which, within the knowledge of the party so swearing is not true, there shall be a forfeiture of the vessel (or the value thereof) documented or operated hereunder in respect to which the oath shall have been made. If any vessel shall transport merchandise for hire in violation of this section, such merchandise shall be forfeited to the United States. If any vessel shall transport passengers for hire in violation of this section, such vessel shall be subject to a penalty of $200 for each passenger so transported. Any penalty or forfeiture incurred under this section may be remitted or mitigated by the Secretary of the Treasury [now Secretary of Transportation] under the provisions of section 7 of this title.

"Any corporation which has filed a certificate with the Secretary of the Treasury [now Secretary of Transportation] as provided for herein shall cease to be qualified under this section if there is any change in its status whereby it no longer meets the conditions above set forth, and any documents theretofore issued to it, pursuant to the provisions of this section, shall be forthwith surrendered by it to the Secretary of the Treasury [now Secretary of Transportation]." (46 U.S.C. 883-1).

(b) A corporation which qualifies as a citizen as defined in paragraph (a) of this section is not thereby precluded from qualifying as a citizen under any other applicable definition and vessels which it owns or operates shall be entitled to be documented as vessels of the United States under any other provision of this part upon compliance with all applicable requirements.

(Sec. 27A, 72 Stat. 1736; 46 U.S.C. 883-1)

§ 67.03-9 Evidence of citizenship; when required.

In addition to any oath, certificate, or declaration of citizenship specified, the Officer in Charge may require the production of such further evidence as may be necessary to satisfy him that the person is a citizen of the United States. The proper notation of the evidence produced shall be made on the papers retained by the Officer in Charge, such as the number, date, and office of issue of an officer's license, seaman's passport, or citizen's passport, or the same data as to a birth or naturalization certificate, a continuous discharge book, or a certificate of identification, etc. The Officer in Charge shall reject any evidence believed by him to be unauthentic.

§ 67.03-11 Acceptable evidence of citizenship.

As evidence of his citizenship, a naturalized citizen shall be required in every case to present a certificate of his naturalization. A derivative citizen shall be required to present either a certificate of naturalization of either parent through whom he derived his own citizenship, together with a birth certificate or other evidence satisfactorily establishing that he was under 21 years of age at the time of his parent's naturalization, or a certificate of derivative citizenship. The usually acceptable evidence of citizenship for other persons is described below in the order of desirability.

(a) A birth certificate or certified copy.

(b) A baptismal certificate or parish record made within 1 year after birth.

(c) A certificate of a practicing physician that he attended the birth and that he has a record in his possession showing the date on which it occurred.

(d) A State Department passport.

(e) An active commission in the U.S. Navy, Marine Corps, Coast Guard, or reserve component thereof.

(f) An active commission in the U.S. Army or a reserve component thereof issued prior to May 26, 1942.

(g) A license as master, mate, engineer, or pilot issued by the Coast Guard, or a license as master, mate, engineer, or pilot issued by the former Bureau of Marine Inspection and Navigation when such license shows on the back thereof that satisfactory evidence of citizenship of the holder was produced at the time of the issuance of such license.

(h) A certificate of registry as staff officer.

(i) A continuous discharge book or certificate of identification issued by the Coast Guard which shows that the holder is an American citizen, or a continuous discharge book or certificate of identification issued by the former Bureau of Marine Inspection and Navigation which shows the holder is an American citizen, provided the records of that Bureau (now maintained by the Coast Guard) indicate that the holder of such continuous discharge book or certificate of identification has produced satisfactory evidence of his citizenship.

(j) A delayed certificate of birth. If an applicant claiming to be a citizen of the United States submits a delayed certificate of birth which has been issued in accordance with the procedure outlined in the Manual of Uniform Procedure for the Delayed Registration of Births (issued by the Department of Commerce on July 16, 1941, and filed with the Office of the Federal Register) and recites on its face the evidence of citizenship in the absence of any collateral facts indicating fraud in its procurement. In order to receive consideration as a delayed certificate of birth, the certificate shall have been issued strictly in accordance with the provisions of the manual above referred to. Any delayed birth certificate so issued shall be given consideration but shall not necessarily be considered prima facie evidence of citizenship.

(k) If none of the foregoing requirements can be met by the applicant, he shall make a statement to that effect, and, in an attempt to establish citizenship, he may submit for consideration data of the following character:

(1) Report of the Census Bureau showing the earliest record of age or birth available (Census records are available for the following years: 1860, 1870, 1880, 1900, 1910, 1920, 1930, 1940, and 1950). Request for such information shall be addressed to the Director of the Census, Washington, D.C. 20225. In making such request, definite information must be furnished the Census Bureau as to the place of residence when the first census was taken after birth of the applicant, giving the name of the street and number of the house, or the names of the cross streets between which the house was located if residing in a city; or the name of the town, township, precinct, magisterial district, militia district, beat or election district, if residing in the country; also the names of parents, or the names of other persons with whom residing on the date specified.

(2) Declarations of fact by parents or relatives; declarations by two or more responsible citizens of the United States stating facts of which they have knowledge tending to establish the applicant's citizenship; school records; immigration records; or insurance policies.

Subpart 67.05—Provisional Registers

NOMENCLATURE CHANGE: 45 FR 64586, Sept. 30, 1980.

§ 67.05-1 Applicability.

(a) Consular officers of the United States are authorized to issue a provisional certificate of registry to any vessel abroad which has been purchased by a citizen, as defined in Subpart 67.03, and which at the time of such purchase is not documented as a vessel of the United States.

(b) No provisional certificate shall be issued to any vessel abroad which at the time of its transfer to a citizen of the United States was documented as a vessel of the United States. Such a vessel may be redocumented at a port in the United States upon compliance with the requirements outlined in Subpart 67.55 or if not so redocumented while abroad, it shall nevertheless be entitled to all the privileges and benefits of a vessel of the United States up to and for the purpose of its first arrival thereafter within a marine inspection zone.

(Sec. 1, 38 Stat. 1193, as amended, R.S. 4166, as amended; 46 U.S.C. 12, 35; E.O. 10351, FR 4517)

§ 67.05–3 Privileges.

A provisional certificate shall entitle the vessel to the privileges of a vessel of the United States in trade with foreign countries or with the islands of Guam and Tutuila until the expiration of 6 months from the date thereof, or until 10 days after the vessel's first arrival in a port of the United States, whichever first happens, and no longer. On arrival at a port of the United States, the vessel shall become subject to the laws relating to officers, inspection, and measurement.

(Sec. 1, 38 Stat. 1193, as amended, R.S. 4166, as amended; 46 U.S.C. 12, 35)

§ 67.05–5 Presentation of bill of sale to an American consular officer.

When a bill of sale covering such transfer is presented to an American consular officer—

(a) Satisfactory evidence shall be produced to establish that the transfer of registry has the approval of the foreign government concerned.

(b) The bill of sale shall be filed with him.

(c) The vendee shall submit a certificate as to the bona fides of the transfer of title and the citizenship of the vendee which the consul shall file with the bill of sale.

(d) If the vendor or his duly authorized representative be present, he shall also sign the certificate.

(e) The consular officer will investigate the circumstances surrounding the sale of the vessel and then communicate by dispatch, or by cable at the expense of the applicant, with the Commandant through the Department of State, setting forth the results of his investigation; pertinent data regarding the vessel, such as its name, former nationality, rig, and gross and net tonnages; that the bill of sale and certificate of bona fides have been filed with him, giving the names of the vendor and vendee; whether the proposal to have the vessel placed under American registry has the approval of the foreign government concerned, or, if such approval is not required, stating that fact; his opinion as to whether the transfer was made in good faith; and whether it is intended that the vessel will be navigated to the United States on a voyage expected to terminate before the expiration date of the provisional register to be issued.

(f) On receipt of such a communication, if the transfer appears to be in good faith and the documentation of the vessel is not contrary to the policy of this Government, the Commandant will award signal letters to the vessel and, through the usual channels, will promptly authorize the State Department to instruct the consular officer to issue a provisional certificate, Form CG–1266A, to the vessel. The State Department will then cable, at the expense of the parties concerned, instructions and data for the issue of the provisional register.

(Sec. 1, 38 Stat. 1193, as amended; 46 U.S.C. 12)

§ 67.05–7 [Reserved]

§ 67.05–9 Presentation of bills of sale to an Officer in Charge.

If bills of sale covering such transfers are presented to an Officer in Charge, the procedure outlined in § 67.05–5 (a) through (e) shall be followed, except that the Officer in Charge shall communicate directly with the Commandant. Thereafter, if the transfer appears to be in good faith and it is not contrary to the policy of this Government, the Commandant will award signal letters to the vessel and, through the usual channels, will promptly request the State Department to authorize the appropriate consular officer to issue a provisional certificate to the vessel. The State Department will then cable, at the expense of the parties concerned, instructions and data for the issue of the provisional register. No provisional certificate of registry shall be issued in any case unless authorized by the Commandant.

(Sec. 1, 38 Stat. 1193, as amended; 46 U.S.C. 12)

§ 67.05-11 Forwarding of duplicate certificate to Commandant.

A duplicate provisional certificate, Form CG-1266A, shall be forwarded as soon as practicable in every case by the issuing officer through the usual channels to the Commandant.

(Sec. 1, 38 Stat. 1193, as amended; 46 U.S.C. 12)

Subpart 67.07—Marine Documents

NOMENCLATURE CHANGE: 45 FR 64586, Sept. 30, 1980.

§ 67.07-1 Permanent and temporary.

Marine documents are of two descriptions, (a) permanent, granted to vessels at their home ports,[4] and (b) temporary, granted to vessels at ports other than their home ports (the ports at which marine documents may be issued are indicated in § 66.05-1 of this chapter).

§ 67.07-3 Validity.

(a) A register or enrollment shall be valid until a contingency arises requiring its surrender. (See Subparts 67.33 and 67.35.) A license shall be valid for 1 year only, but may be renewed or changed at any time during the year for which it is granted (with respect to registers, enrollments and licenses, and licenses, issued under the Act of August 9, 1954, see §§ 67.90-9, 67.90-35(b), and 67.90-37). Care shall be taken that only one license, and for one employment, be granted to a vessel for the same period, except that a license may be granted for the "coasting trade and mackerel fisheries."

(b) No enrollment and license or license shall be considered in force longer than the vessel to which it is granted is owned as stated in the document, nor shall it be valid if the description of the vessel is changed, nor if the vessel engages in any business or employment other than that for which the document was granted.

(R.S. 4138, 4191, 4315, as amended, 4324, 4327; 46 U.S.C. 16, 62, 255, 266, 269)

§ 67.07-5 Execution.

All marine documents shall be signed and sealed by the Officer in Charge before being issued.

(R.S. 4157, as amended, 4158, as amended; 46 U.S.C. 27, 28)

§ 67.07-7 Issuance of new marine document in lieu of one surrendered.

When a new marine document is issued in lieu of one surrendered, such new document shall in every case cite the previous document by number, date, and port of issue, carry any notation of the authority for redocumentation or of the existence of an unsatisfied preferred mortgage appearing on the surrendered document, and give the cause of surrender of the old document. A certificate of the builder shall not be required, nor shall a certificate of admeasurement be required unless some change of tonnage has taken place since the time of the previous documentation. (See Subparts 67.33, 67.35, and 67.41.)

§ 67.07-9 Dimensions and tonnage.

(a) The marine document of every vessel except one admeasured under the provisions of Subpart 69.17 of this subchapter shall express the following:

(1) Length, breadth, and depth;

(2) If applicable, the depth (D_t) and the length (L_t)used with the tonnage mark table and the distances to the tonnage mark from the line of the

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[4] Under the "Seattle plan," which is in force in a number of marine inspection zones, a vessel having its home port within the marine inspection zone may secure a permanent document at any other port in the same marine inspection zone at which marine documents are issued.

upper deck and from the molded line or equivalent of the second deck;

(3) The number of decks and masts;

(4) Capacity under the tonnage deck, that of the between decks, and also separately, permanently enclosed spaces on or above the upper deck to the hull required to be included in the gross tonnage, and the omitted spaces, whether open or closed-in, on, above, or below the upper deck;

(5) The gross tonnage or tonnages;

(6) Items of deduction;

(7) The net tonnage or tonnages; and

(8) In appropriate cases, the height of the upper deck to the hull above the tonnage deck.

(b) The marine document of every vessel admeasured under the provisions of Subpart 69.17 of this subchapter shall express her length, breadth, depth, and gross and net tonnages.

(c) Every marine document issued to a vessel admeasured under the provisions of Pub. L. 89-476 (see Subpart 69.17 of this subchapter) shall bear on its face the following notation: "This vessel has been admeasured under the provisions of Pub. L. 89-476 and shall be used exclusively as a pleasure vessel until readmeasured and redocumented under the appropriate statutes."

§ 67.07-11 Registers.

Vessels of the United States engaged in the foreign trade shall be registered, except as provided for in Subpart 67.61 with respect to vessels on the northern, northeastern, and northwestern frontiers. Vessels engaged in domestic trade only, other than vessels owned by citizens of the United States as defined in § 67.03-7(a) and documented or to be documented under the Act of September 2, 1958 (46 U.S.C. 883-1), may be registered. (See Subpart 67.41.)

(R.S. 4132, as amended, sec. 22, 41 Stat. 997, sec. 27A, 72 Stat. 1736; 46 U.S.C. 11, 13, 883-1)

§ 67.07-13 Enrollment and license; coasting trade and fisheries.

(a) When employed in the coasting trade and fisheries, a vessel of 20 net tons or over shall be enrolled and licensed and a vessel of 5 net tons or over but less than 20 net tons shall be licensed, unless such vessel is registered. (See § 67.07-11.)

(b) A vessel engaged exclusively in the cod fishery shall be licensed for that fishery. A vessel engaged in whaling shall be licensed for the whale fishery. A vessel engaged in taking fish of any other description shall be licensed for the mackerel fishery. A vessel licensed for the fisheries shall not be deemed to be used in an employment for which not licensed solely because it occasionally takes on board on the high seas and transports without a monetary consideration to a port of the United States the catch of another fishing vessel of the United States. A vessel which engages in both the coasting trade and fishing (other than whaling) may be licensed for the "coasting trade and mackerel fishery." A vessel engaged in taking out fishing parties is not a fishing vessel and shall be licensed for the coasting trade unless it intends to proceed to a foreign port, in which case a certificate of registry is required. (See § 67.07-11. See Subpart 67.61 for vessels on the Great Lakes.)

(c) The trade expressed in the body of a document is controlling and may not be limited or expanded by the statement of service in the space provided therefor.

(d) An enrolled and licensed vessel may engage in trade with Guantanamo Bay Naval Station.

(R.S. 4311, as amended, 4321, as amended, sec. 7, 24 Stat. 81, as amended, 75 Stat. 410; 46 U.S.C. 251, 263, 319, 404a)

Subpart 67.09—Builder's Certificates

§ 67.09-1 Applicability.

In order to document a vessel of class 1, 2, 6, or 7 (see § 67.01-5), built in the United States and not before documented, the owner shall produce to the Officer in Charge a certificate on Form CG-1261 from the builder under whose direction the vessel was built that she was so built, stating the place and time of building, the person or persons for whom built, number of decks and masts, length, breadth, depth, tonnage, and such other particulars as are usually descriptive of a vessel. This certificate shall be sufficient to authorize the removal of a new vessel, if in ballast only, from the marine inspection zone where she was built to another marine inspection zone in the same or an adjoining State where the owner or owners actually reside.

(R.S. 4147; 46 U.S.C. 24)

§ 67.09-3 Waiver.

When for any cause it is found impracticable to obtain the certificate of the builder, other competent evidence establishing the particulars and facts required to be certified by him may be accepted with the approval of the Commandant.

§ 67.09-5 Place and time of build.

The place of build is where the hull was built. The time of build is the year of completion. Both shall appear in all marine documents.

Subpart 67.11—Official Number and Signal Letters

§ 67.11-1 Application for official number.

(a) Every documented vessel shall have an official number [5] awarded by the Commandant. Application therefor shall be made on Form CG-1320 by the owner or his agent through the Officer in Charge. When the application is filed with the Officer in Charge at the port designated as the home port of the vessel, the application shall be in triplicate. When the application is filed with the Officer in Charge at any port other than the home port of the vessel, the application shall be in quadruplicate. The name or names of any former owner or owners shall be stated on the application. If there was no former owner, that fact shall be stated. In the case of corporate ownership, the application shall be signed in the corporate name by the president, secretary, or a specially authorized officer of the corporation, or by an authorized agent. In the case of a partnership, the partnership name shall be signed by one of the partners, or by a duly authorized agent; the name of each of the partners shall be stated but the proportionate interest of each in the partnership business shall not be stated. In the case of individual ownership by two or more persons, the application shall be signed by all the owners, by a duly authorized agent, or by one of the owners as managing owner, provided there is filed with the Officer in Charge a written authorization for him to act in that capacity signed by the owners of a majority interest in the vessel; in every case, the name of each owner shall be stated. In every case the capacity in which the person signs, whether as owner, managing owner, agent, etc., shall be clearly stated below his signature. If a signature is by mark, it shall be witnessed by two persons, or acknowledged. Any acknowledgment valid under the law of the State where made may be accepted. No officer or employee of the Coast Guard is authorized by section 486, Tariff Act of 1930, to take such acknowledgments.

(b) Each application for an official number shall be accompanied by a designation of home port on Form CG-1319.

(c) When an application for an official number is filed with the Officer in Charge at the port designated as the home port of the vessel, the original and one copy of Form CG-1320 shall be forwarded to the Commandant. When an application for an official number is filed with the Officer in Charge at any port other than the home port of the vessel, the original and two copies of the application shall be forwarded to the Commandant. When an official number is awarded, the Commandant will return the original to the Officer in Charge from whom it was received. The Officer in Charge shall make a notation of the official number awarded on the retained copy of the application and shall deliver the original to the applicant. When the application for official number is filed with the Officer in Charge at any port other than the home port of the vessel, and an official number is awarded to the vessel, a copy of the notice of award will also be forwarded by the Commandant to the Officer in Charge at the home port.

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[5] "The Commissioner of Customs [now Secretary of Transportation] shall have power, under such regulations as he shall prescribe, to establish and provide a system of numbering vessels so registered, enrolled, and licensed; and each vessel so numbered shall have her number deeply carved or otherwise permanently marked on her main beam; and if at any time she shall cease to be so marked, such vessel shall be liable to a fine of $30 on every arrival in a port of the United States if she have not her proper official number legally carved or permanently marked." (46 U.S.C. 45)

(R.S. 4177, as amended; 46 U.S.C. 45)

§ 67.11-3 Signal letters.

(a) Any seagoing vessel of 100 tons or over, in addition to an official number, may have signal letters awarded. Application therefor shall be made by the owner or his agent through an Officer in Charge on the application for official number, Form CG-1320, or, if the application is made subsequent to the filing of an application for an official number, by a letter transmitted through the Officer in Charge. Signal letters will not be awarded to a seagoing vessel of less than 100 tons except upon special authorization by the Commandant.

(b) A new application for the award of signal letters to a vessel of the United States shall not be required by reason of any change in status or ownership of such vessel or by reason of the redocumentation of such vessel after a period during which it has been out of documentation. The award of such letters shall not be canceled except upon special authorization of the Commandant.

§ 67.11-5 Cancellation of signal letters.

Under certain circumstances, the Commandant will give consideration to granting a special authorization for the cancellation of the award of signal letters when the vessel to which such letters are awarded is no longer documented and, in the case of an application relating to a ship station, the vessel has not been so documented for a period of not less than 10 years. Such consideration will be given upon application by or on behalf of a person having a permit issued by the Federal Communications Commission for the construction or operation of a broadcast station or the operation of a ship station or by a person who has applied to the Federal Communications Commission for transfer or assignment of an existing station. In either case, the application must state that the person desires to use the letters in connection with the operation of such station. Such application shall be submitted to the Commandant in writing and shall state:

(a) The name and address of the permittee or applicant for transfer or assignment;

(b) The date of granting of such permit or filing of such application for transfer or assignment;

(c) The type of station involved;

(d) The letters desired; and

(e) The name and official number of the vessel to which such letters are awarded, if known to the applicant.

Subpart 67.13—Marking of Name and Hailing Port on Documented Vessel

§ 67.13-1 Marking of name and hailing port.

(a) Except as provided in §§ 67.13-3, 67.13-5, and 67.13-9, the name of every documented vessel shall be marked in full upon each bow and upon the stern, and the hailing port (see § 67.13-7) shall also be marked in full upon the stern.

(b) The name and hailing port of every documented vessel shall be painted, carved, or gilded in Roman letters in a light color on a dark ground, or in a dark color on a light ground, and shall be distinctly visible. The letters shall not be less than 4 inches high. Every steam vessel of the United States shall, in addition, have her name conspicuously placed in distinct, plain letters not less than 6 inches high on each outer side of the pilot house, if it has one, and if the vessel has side wheels, also on the outer side of each wheel house.

(R.S. 4178, as amended, sec. 21, 23 Stat. 58, R.S. 4214, as amended, 4495; 46 U.S.C. 46, 47, 103, 493)

§ 67.13-3 Vessels not affording sufficient space for marking.

On a so-called "double ender" vessel the required names shall be placed on the parts corresponding to the bow and stern. If either the bow or stern, or both, of any such or other vessel does not afford sufficient space for marking the required name or names, or if the name marked in such a place would be obscured or concealed while the vessel is in operation (for example, by a fender), the names shall be placed on an appropriate adjacent part.

§ 67.13-5 "Scow-built" vessels.

The name of a scow, barge, or other vessel "scow-built" or with square bow may be marked on the bow instead of the side when such marking would be speedily obliterated by chafing against other vessels, piles, or docks.

§ 67.13-7 Hailing port.

The hailing port to be marked on the stern may be either the port where the vessel is permanently documented, or the place in the same marine inspection zone where the vessel was built or where one or more of the owners reside.

(Sec. 21, 23 Stat. 58; 46 U.S.C. 47)

§ 67.13-9 Yachts.

Every documented yacht shall have its name and hailing port placed on some conspicuous part of its hull.

(R.S. 4214, as amended; 46 U.S.C. 103)

Subpart 67.15—Evidence of Marking; Official Number, Net Tonnage, Name and Home Port

§ 67.15-1 Requirement for proper marking.

Except as provided for in § 67.75-17(a), marine documents shall not be issued until proper evidence is produced that the official number and net tonnage have been properly marked upon the vessel's main beam (see § 69.05-1 of this chapter) and that her name and hailing port have been properly marked as provided in Subpart 67.13.

§ 67.15-3 Evidence of marking.

The evidence of proper marking required by § 67.15-1 shall be a certificate by an officer or employee of the Coast Guard on Form CG-1322. If the vessel is at a place not readily accessible to an officer or employee of the Coast Guard, the owner or his agent shall certify as to the proper marking; but as soon as she arrives at a place accessible to an officer or employee of the Coast Guard, a certificate on Form CG-1322 shall be required.

Subpart 67.17—Verification of Over-all Dimensions

§ 67.17-1 Verification.

A marine document issued upon admeasurement under the provisions of Subpart 69.17 of this chapter may, in the discretion of the documentation officer concerned, not be renewed; nor another marine document issued for a vessel documented upon such admeasurement until an officer or employee of the Coast Guard has verified the over-all dimensions stated in the application for such admeasurement.

(R.S. 4150, as amended, 4153, as amended; 46 U.S.C. 74, 77)

§ 67.17-3 Corrections.

Any correction of the stated over-all dimensions of a vessel as the result of the verification provided for in § 67.17-1 shall be deemed a change in the description of the vessel within the meaning of § 67.07-3(b).

(R.S. 4150, as amended, 4153, as amended; 46 U.S.C. 74, 77)

Subpart 67.19—Home Port

§ 67.19-1 Definition.

A vessel's home port[6] is that port where marine documents may be

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[6] "For the purposes of the navigation laws of the United States * * * every vessel of the United States shall have a 'home port' in the United States, including Puerto Rico, which port the owner of such vessel, subject to the approval of the Commissioner of Customs [now Commandant] shall specifically fix and determine, and subject to such approval may from time to time change. Such home port shall be shown in the register, enrollment, and license, or license of such vessel, which documents, respectively, are referred to as the vessel's document. The home port shown in the document of any

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issued to vessels (see § 66.05-1 of this subchapter) which has been fixed and determined by the owner with the approval of the Officer in Charge or documentation officer at the port designated or at the port where a temporary marine document is to be issued to the vessel. It is the port at which a vessel's permanent marine documents are issued.

(R.S. 4141, sec. 1, 43 Stat. 947, as amended; 46 U.S.C. 17, 18)

§ 67.19-3 Designation of home port; when required.

(a) Before a marine document is issued to a vessel never before documented or to a documented or previously documented vessel when there has been some change in ownership in whole or in part or when a change in home port is desired, the owner of the vessel shall submit his designation of home port for the vessel on Form CG-1319, signed as provided for in § 67.11-1(a), to the Officer in Charge for the port designated or the port where a temporary marine document is to be issued. When the designation is filed with the Officer in Charge at the port designated as home port, it shall be filed in duplicate; when filed at a port where a temporary marine document is to be issued, it shall be filed in triplicate. If the home port so designated is different from the last previous home port of the vessel, the owner shall also request the Officer in Charge at the previous home port to forward to the Officer in Charge at the designated port an abstract of title on Form CG-1332 (see § 67.42-27(a)).

(b) If an owner desires that the home port be elsewhere than the port at or nearest the place in the same marine inspection zone where the vessel business of the owner is conducted, he shall submit with his designation of home port a detailed statement setting forth the reasons.

(R.S. 4141, sec. 1, 43 Stat. 947, as amended; 46 U.S.C. 17, 18)

§ 67.19-5 Examination of instruments of title.

Whenever an owner submits a designation of home port to an Officer in Charge, the Officer in Charge shall examine the instruments transferring title to the vessel and the abstract of title on Form CG-1332 and satisfy himself that the home port has in fact been designated by the owner of the vessel or some person authorized to act for him.

(R.S. 4141, sec. 1, 43 Stat. 947, as amended; 46 U.S.C. 17, 18)

§ 67.19-9 Approval of designation.

The Officer in Charge or documentation officer for the port at which a designation is filed in accordance with § 67.19-1 may approve that designation provided recordable instruments covering each sale, gift, or conveyance (including a conveyance in trust), if any, since the acquisition of title by the last owner of record are presented with the designation. The Officer in Charge, or the documentation officer for the port at which a designation is filed when authorized by the Officer in Charge, may waive the requirements for production of recordable instruments of conveyances and may approve that designation if he is satisfied that it is impracticable to furnish any such instrument and that the owner has legal title to the vessel.

(Sec. 1, 43 Stat. 947, as amended; 46 U.S.C. 18.)

[CGD 79-111, 44 FR 68469, Nov. 29, 1979]

§ 67.19-11 Forwarding of duplicate copy of designation to Commandant.

(a) If the designation of home port is approved as provided for in § 67.19-9, the Officer in Charge shall forward a duplicate copy of the designation to the Commandant. If the designation is so approved at a port other than the home port, the Officer in Charge shall also forward the triplicate copy of the designation to the Officer in Charge at the home port.

(Sec. 2, 23 Stat. 118, as amended, sec. 1, 43 Stat. 947, as amended; 46 U.S.C. 2, 11, 13, 18, 883; 49 CFR 1.46(b))

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vessel of the United States in force on February 16, 1925, shall be deemed to have been fixed and determined in accordance with the provisions hereof. * * *" (46 U.S.C. 18.)

[CGFR 69-138, 34 FR 20105, Dec. 23, 1969, as amended at CGD 79-111, 44 FR 68469, Nov. 29, 1979]

§ 67.19-13 Vessel to be documented substantially simultaneously with approval of designation.

No officer or employee of the Coast Guard designated to grant approvals of designations of home ports shall approve any such designation unless it appears that the vessel will be documented as a vessel of the United States substantially simultaneously with the approval of the designation by any such officer or employee. When a designation has been approved and the vessel is not so documented, the approval granted shall be cancelled. The Officer in Charge, in subsequently transmitting a copy of a new designation by the same owner shall indicate in his remarks the date of the previous approval and that it was cancelled because of failure to document the vessel.

(Sec. 1, 43 Stat. 947, as amended; 46 U.S.C. 18)

[CGD 79-111, 44 FR 68469, Nov. 29, 1979]

Subpart 67.21—Forms of Oath of Owner and Master

§ 67.21-1 Oath of ownership.

Prior to the documentation or redocumentation of any vessel, except in case of redocumentation of a vessel at a port other than the home port upon change in trade or loss of marine document or when the renewal spaces are filled, there shall be filed an oath of ownership on Form CG-1258 if the vessel is owned by an individual, partnership, unincorporated company, association, or the United States; or on Form CG-1259 or 1260, whichever is applicable if the vessel is owned by a corporation.

(R.S. 4142, 4139, as amended, 4159, 4161, 4214, as amended, 4312, 4314, as amended, 4328, as amended, 4330, sec. 27A, 72 Stat. 1736; 46 U.S.C. 19, 20, 29, 31, 103, 252, 254, 270, 272, 883-1)

§ 67.21-3 Special statements on oath; when required.

If any vessel falls within class 4, 5, 6, or 7 of § 67.01-5, there shall be inserted immediately after footnote 1 of Form CG-1258 or immediately after footnote 3 of Form CG-1259 the appropriate one of the following clauses:

(a) For class 4—

On the —— day of ————, 19—, captured in war by a citizen (or citizens) of the United States and lawfully condemned as prize by a decree, sentence, or judgment of the ———— court of ————, an authenticated copy of which I now produce.

(b) For class 5—

Adjudged to be forfeited, for a breach of the laws of the United States, by a decree, sentence, or judgment of the ———— court of ————, an authenticated copy of which I now produce.

(c) For class 6—

Formerly the ————, purchased from the United States (or from an officer, naming him and his office).

(d) For class 7—

Authorized to be documented by act of Congress and by the Commandant, United States Coast Guard, by letter under date of ————, an authenticated copy of which I now produce.

(R.S. 4132, as amended, 4142, 4139, as amended, 4159, 4161, 4214, as amended, 4312, 4314, as amended, 4328, as amended, 4330, sec. 9, 39 Stat. 730, as amended, sec. 27A, 72 Stat. 1736; 46 U.S.C. 11, 19, 20, 29, 31, 103, 252, 254, 270, 272, 808, 883-1)

§ 67.21-5 Oath of master for documentation.

The master's oath required for the license or enrollment and license of a vessel shall be executed in the space provided therefor on Form CG-1258, CG-1259, or CG-1260. If the vessel is to be registered and the master is within the marine inspection zone where the registry is to be made, the master's oath shall be on Form CG-1258, or CG-1259. Such form of oath shall not be used for a renewal of license under § 67.21-7.

(R.S. 4320, as amended, 4330; 46 U.S.C. 262, 272)

§ 67.21-7 Oath of master for renewal.

The master's oath for the renewal of a license shall be executed on Form CG-1280. Except when the vessel is at its home port, such an oath shall be taken for the renewal of the license even though it may be necessary to issue a new document because all renewal spaces are filled on the former document.

(R.S. 4325, as amended; 46 U.S.C. 267)

Subpart 67.23—Execution of Oaths for Documentation, for Operation of Certain Vessels Exempt From Documentation, and for Qualification of Certain Corporations as Citizens of the United States

§ 67.23-1 Individual.

If the vessel be owned by one individual, the oath shall be taken by him or by his duly authorized agent.

(R.S. 4142, 4139, as amended, 4143, 4163, 4314, as amended; 46 U.S.C. 19, 20, 21, 33, 254)

§ 67.23-3 Several individuals, firm, or unincorporated company.

If the vessel be owned by several individuals or a firm or unincorporated company, the oath shall be taken by the managing owner or a member of the firm who shall specify the names and places of abode of, and except in the case of a partnership the proportions of the vessel owned by, each of the others, and shall certify to their citizenship.

(R.S. 4142, 4139, as amended, 4143, 4163, 4314, as amended; 46 U.S.C. 19, 20, 21, 33, 254)

§ 67.23-5 Corporation.

If the vessel be owned by a corporation, the oath shall be taken by its president, its secretary, or by any other officer or agent thereof duly authorized by a writing under the corporate seal to act in its behalf. Such officer or agent shall also furnish a certificate as to the organization of the corporation and the names of its president or other chief executive officer, chairman of its board of directors, and directors, showing the home address and citizenship of each and the number of directors necessary to constitute a quorum, including a quotation of the pertinent portion of the articles of incorporation, bylaws, or other corporate papers relating to the matter of a quorum. If the corporate owner is qualified as a citizen of the United States under the definition contained in § 67.03-7(a), the oath shall be on Form CG-1260 and the accompanying certificate shall include information as to the names, home address, and citizenship of all officers and directors.

(R.S. 4138, 4142, 4139, as amended, 4143, 4163, 4314, as amended, 72 Stat. 1736; 46 U.S.C. 16, 19, 20, 21, 33, 254, 883-1)

§ 67.23-7 Corporation qualifying under the Act of September 2, 1958 (46 U.S.C. 883-1).

(a) A corporation which meets the qualification requirements of § 67.03-7(a) as a citizen of the United States and which seeks to operate in trade a vessel owned by such corporation and exempt from documentation under § 67.01-11(a) shall file in duplicate with the Officer in Charge of the marine inspection zone in which the vessel business of the owner is conducted, a certificate under oath on Form CG-1260 by its president, its secretary, or by any officer or agent thereof duly authorized by a writing under the corporate seal to act in its behalf. Such officer or agent shall also furnish in duplicate a certificate as to the organization of the corporation and the names of all officers and directors of the corporation, showing the home address and citizenship of each.

(b) A corporation which meets the qualification requirements of § 67.03-7(a) as a citizen of the United States and which seeks to qualify under the Act of September 2, 1958 (46 U.S.C. 883-1), for any purpose other than as outlined in paragraph (a) of this section shall file in duplicate with the Commandant a certificate under oath on Form CG-1260, appropriately modified to omit reference to any vessel, by the corporation's president, its secretary, or by any other officer or agent thereof duly authorized in writing under the corporate seal to act in its behalf. Such officer or agent shall also furnish in duplicate a certificate as to the organization of the corporation and the names of all officers and directors of the corporation, showing the home address and citizenship of each, and shall state in duplicate in writing the reasons for desiring to qualify under the Act and the reasons why qualification is not sought under § 67.23-5 or paragraph (a) of this section.

(c) If any change occurs in any corporation after the filing of a certificate under oath and the other papers required under paragraph (a) or (b) of this section whereby the corporation is no longer entitled to be deemed a citizen of the United States as defined in § 67.03-7(a), the corporation shall cause a report of such change to be made in writing in duplicate to the office where the previous certificate under oath was filed.

(d) Upon the filing of a certificate under oath and the other papers required under paragraph (a) or (b) of this section, the Officer in Charge or the Commandant shall furnish the corporation, through its officer or agent, a certificate of filing of such oath on Form CG-1262 which shall be valid for a period of 3 years from the date of its issuance unless there first occurs a change in corporate status requiring a report under paragraph (c) of this section. On or before the date of expiration of the validity of such certificate, a new oath on Form CG-1260 and the other papers required by paragraph (a) or (b) of this section shall be filed with the appropriate officer.

(e) The duplicate copy of the oath and other papers required by paragraphs (a) and (c) of this section and a copy of any certificate issued by the Officer in Charge under paragraph (d) of this section shall be forwarded promptly to the Commandant, who will cause notice of the contents thereof to be given to all Officers in Charge concerned. The Commandant will also give similar notice of the contents of any oath filed with him under paragraph (b) of this section.

(72 Stat. 1736; 46 U.S.C. 883-1)

§ 67.23-9 Parent or subsidiary corporation.

(a) A parent or subsidiary corporation as defined in §§ 66.03-17 and 66.03-19 of this subchapter shall file a certificate under oath on Form CG-1263 executed by its duly authorized officer or agent establishing the facts respecting the citizenship of such parent or subsidiary corporation before any vessel owned by a corporation as defined in § 67.03-7(a) shall transport any merchandise or passengers for such parent or subsidiary corporation, whether the transporting vessel is documented as a vessel under the laws of the United States or is exempt from the requirements for documentation under § 67.01-11(b) or otherwise.

(b) The certificate under oath required under paragraph (a) of this section shall be filed in duplicate with the Officer in Charge at the vessel's home port if the vessel is documented as a vessel of the United States or, if not so documented, with the Officer in Charge of the marine inspection zone in which the vessel business of the owner is conducted. Such officer or agent shall also furnish in duplicate a certificate as to the organization of the corporation and the names of all officers and directors of the corporation, showing the home address and citizenship of each.

(c) When there is any change in the status of a parent or subsidiary corporation which is a citizen of the United States whereby such corporation shall cease to be qualified as a citizen, such corporation shall cause a report of such change to be made in writing in duplicate to the Officer in Charge at the port where the previous certificate under oath was filed.

(d) The duplicate copy of the oath and other papers required by this section shall be forwarded promptly to the Commandant, who will cause notice of the contents thereof to be given to all Officers in Charge concerned.

(72 Stat. 1736; 46 U.S.C. 883-1)

§ 67.23-11 Proportion owned to be stated in oath.

In all cases where there is more than one owner, the proportions owned by each shall be stated in the oath.

§ 67.23-13 Taking of oath of owner or master.

The oath of the owner or of the master required for documentation may be taken before an Officer in Charge or before any officer authorized by the laws of a State to administer oaths generally. If the oath is not taken before the Officer in Charge, it may be mailed to him.

(5 U.S.C. 2903(c)(2))

Subpart 67.25—Issue and Record of Marine Documents

§ 67.25-1 Retention of copy of marine document by issuing office.

An exact copy of each marine document issued by an Officer in Charge shall be placed in a permanent record kept for that purpose and a proper index made thereof on Form CG-1241 (on Form CG-2112 at the port of New York).

(R.S. 4176, as amended; 46 U.S.C. 44)

§ 67.25-3 Surrender of former marine document upon application for a new document.

At the time application is made for a new marine document, any former document of the vessel shall be surrendered to the Officer in Charge to whom the application is made, unless the former marine document has been lost, mutilated, destroyed, or unintentionally mislaid. (See § 67.43-1.)

(R.S. 4167, 4322, 4326, 4329, as amended; 46 U.S.C. 36, 264, 268, 271)

§ 67.25-5 Failure to surrender document on sale or transfer of vessel sold or transferred by process of law.

On proof that any vessel has been sold or transferred by process of law and that her former owner has retained the marine document, the Officer in Charge at the vessel's home port may grant a new marine document and shall not refuse to issue such a document merely because the last document is retained by the former owner. In any such case, the new owner shall not be required to produce and surrender the former marine document, but the issuance of the new document does not remove the liability of the holder of the former document for failure to surrender it.

(R.S. 4164, as amended; 46 U.S.C. 34)

§ 67.25-7 Report of change of address of owner.

Upon any change in the address of an owner as shown upon a marine document, a prompt report, giving both the old and the new addresses, shall be made to the Officer in Charge at the vessel's home port and the marine document shall be presented for amendment of the address to any Officer in Charge at the first opportunity.

§ 67.25-9 Approval of designation of home port required prior to issuance of marine document.

No marine document shall be issued to any vessel prior to the receipt by the Officer in Charge of the approval of the designation of the home port by or on behalf of the owner in whose name the document is to be issued.

(Sec. 1, 43 Stat. 947, as amended; 46 U.S.C. 18)

§ 67.25-11 Delivery of marine document in special envelope.

When a marine document is issued to a vessel on the Great Lakes, it shall be delivered by the Officer in Charge in a special envelope, Form CG-1503. When a marine document is issued to a vessel elsewhere than on the Great Lakes, it shall be delivered in a special envelope, Form CG-1502. In the case of the issuance of any marine document other than a register, the date upon which the license for the vessel will expire shall be noted plainly on the face of the envelope.

Subpart 67.27—Permanent Documentation of Vessel Absent From Home Port

§ 67.27-1 Application for marine document.

A permanent marine document may be issued to any vessel absent from her home port upon application to the Officer in Charge for the home port through the Officer in Charge at the port where the vessel shall be. In such case, all requirements which would be applicable if the vessel were at her home port shall be met at the port where she is before the application is forwarded, except that the owner's and master's oaths may be executed at the home port.

(R.S. 4328, as amended; 46 U.S.C. 270)

§ 67.27-3 Issuance and delivery of marine document.

The Officer in Charge through whom application was made shall forward a request for issuance of a permanent marine document to the Officer in Charge at the vessel's home port, who shall issue a permanent document and deliver the document either directly or through the Officer in Charge through whom the application was received.

(R.S. 4328, as amended; 46 U.S.C. 270)

Subpart 67.29—Citizenship of Master; Change of Master

§ 67.29-1 Citizenship requirement.

Every vessel of the United States shall be commanded by a citizen or surrender her marine document.

(R.S. 4131, as amended; 46 U.S.C. 221)

§ 67.29-3 Requirement for report of change of master.

(a) When the master of any documented vessel, except a licensed ferryboat or yacht, is changed, the owner or the new master shall report the change to the Officer in Charge at the port where the change takes place, or where the vessel first arrives thereafter, and produce to him the marine documents and file with him a declaration properly executed on Form CG-1305. The Officer in Charge shall then endorse upon the marine document the name of the new master.

(b) If the declaration on Form CG-1305 is mailed to the Officer in Charge, it shall be accompanied by the vessel's outstanding marine document.

(R.S. 4171, as amended, 4335, as amended, 46 U.S.C. 40, 276)

§ 67.29-5 Alternate masters.

(a) Every application for the endorsement of the names of one or two alternate masters on the license of a vessel in addition to the name of the master already endorsed on the license shall be filed with the Officer in Charge at the home port of the vessel and shall contain a statement of the condition of employment of the vessel. The endorsement of the names of one or two alternate masters upon the license shall be authorized by the Officer in Charge or an employee in his office properly designated to grant such authorization whenever that Officer in Charge or employee, after examining the application, deems the condition of employment of the vessel warrants such action. Under no circumstances shall the endorsement of the names of more than two alternate masters upon the license be authorized. The same declarations shall be required of such alternate masters as are required in the case of other masters.

(b) In the case of a vessel on whose license there are endorsed the names of more than one master, the master actually in charge of the vessel shall assume all the duties and responsibilities imposed by any statute upon masters of vessels and is subject to the liabilities provided by any law against masters of vessels during any period in which he is in charge of the vessel.

(R.S. 4335, as amended; 46 U.S.C. 276)

§ 67.29-7 Certain vessels navigated within the limits of the harbor of any town or city.

If two or more vessels are owned by or under the complete control and management of the same person, association, corporation, etc., and are navigated within the limits of the harbor of any town or city, the name of the owner, if an individual, or of some responsible person acting for the owner, may be endorsed as master on the licenses of all such vessels although the person whose name is so endorsed may not be actually employed on any of the vessels. The same declaration shall be required of such persons as is required in the case of other masters. Any person whose name is so endorsed is subject to the liabilities provided by any law against masters of vessels.

(R.S. 4335, as amended; 46 U.S.C. 276)

§ 67.29-9 Unrigged vessels.

The name of the owner, if an individual, or of some responsible person acting for the owner, may be endorsed as master on the license of any unrigged vessel, except one which is required by law to have on board a certificate of inspection and which is required by that certificate to be manned, although the person whose name is so endorsed may not be actually employed on that vessel. The same declaration shall be required of such persons as is required in the case of other masters. Any person whose name is so endorsed is subject to the liabilities provided by any law against the masters of vessels.

(R.S. 4335, as amended; 46 U.S.C. 276)

§ 67.29-11 Towing vessels.

The name of the owner, if an individual, or of some responsible person acting for the owner, may be endorsed as master on the license of any vessel engaged in towing from any port or place embraced within the coastwise laws of the United States to any other such port or place plying in whole or in part on inland rivers, canals, waterways, sounds, gulfs, lakes, and harbors, not carrying passengers nor proceeding directly or indirectly to any foreign port or place or to any port or place in noncontiguous territory of the United States, although the person whose name is so endorsed may not be actually employed on that vessel. The same declaration shall be required of such persons as is required in the case of other masters. Any person whose name is so endorsed is subject to the liabilities provided by any law against the masters of vessels.

(R.S. 4335, as amended; 46 U.S.C. 276)

§ 67.29-13 Removal of master.

Any person or body corporate having more than one-half ownership of any vessel shall have the same power to remove a master, who is also part owner of such vessel, as such majority owners have to remove a master not an owner. This section shall not apply when there is a valid written agreement subsisting, by virtue of which such master would be entitled to possession.

(R.S. 4250, as amended; 46 U.S.C. 227)

Subpart 67.31—Renewal of License

§ 67.31-1 Requirement for renewal.

(a) A permanent or temporary license shall be presented within 3 days (exclusive of any day on which the marine inspection office is not open for business) after its expiration, to the Officer in Charge of the marine inspection zone where the vessel may then be, or if the vessel is then at sea, within 3 days after her first arrival within any marine inspection zone. A temporary license shall be surrendered within 10 days after the arrival of a vessel at her home port and shall not be renewed at that port.

(b) If a license is presented for renewal at any time within 30 calendar days prior to the date of expiration shown thereon, it may be renewed for a period of 1 year from that date of expiration.

(R.S. 4325, as amended, 4326, 4327, 4498, as amended; 46 U.S.C. 267, 268, 269, 496)

§ 67.31-3 Oath for renewal.

When a license is presented for renewal, the master shall make oath in the form prescribed by § 67.21-7.

§ 67.31-5 Delivery of renewed marine document.

When a license for a vessel on the Great Lakes is renewed, it shall be redelivered by the Officer in Charge in a special envelope, Form CG-1503. When a license is renewed for a vessel elsewhere than on the Great Lakes, it shall be redelivered in a special envelope, Form CG-1502. In either case, the date upon which the license for the vessel will expire shall be noted plainly on the face of the envelope and any previous notation of a date of expiration shall be deleted.

§ 67.31-7 Notice of expiration of license.

The Officer in Charge at the home port of a licensed or enrolled and licensed vessel shall transmit a notice of the date upon which the license will expire and the form of oath to be executed by the master on Form CG-1280 to the last-known address of the owner of the vessel not more than 40 days prior to its expiration nor less than 21 days prior thereto. Neither the failure of an Officer in Charge to transmit such notice and form of oath nor the fact that the master did not receive it shall be deemed to excuse the master from the penalty or penalties provided by law.

Subpart 67.33—Surrender of Permanent Marine Documents

§ 67.33-1 Requirement for surrender.

(a) The marine document shall be surrendered when:

(1) A vessel is sold or transferred in whole or in part;

(2) The owner of the whole or any part of a vessel dies;

(3) A vessel has been lost, abandoned, dismantled, or taken by an enemy, or otherwise prevented from returning to the United States;

(4) A vessel is burned or broken up;

(5) A vessel is altered in form by being lengthened, shortened, or built upon, or is changed from one denomination to another by a change in the method of rigging or fitting;

(6) The tonnage of a vessel is changed for any reason;

(7) A vessel is altered so that it is no longer of the description set forth in its document;

(8) A vessel changes from one employment to another;

(9) A vessel is placed under foreign registry or flag;

(10) A vessel changes her name;

(11) The home port of a vessel is changed;

(12) A president or secretary whose name appears on the document of a vessel owned by a corporation dies, is removed, or resigns;

(13) A trustee is appointed upon bankruptcy of the owner of the whole or any part of a vessel;

(14) A partnership owning an interest in a vessel is terminated or when there is any change in the membership of such partnership without dissolution of the firm; and

(15) There is any change in the status of a corporation which is a citizen of the United States as defined in § 67.03-7(a) whereby such corporation shall cease to be qualified as a citizen thereunder.

(b) The approval of the Officer in Charge of the surrender of the marine document of a vessel covered by a preferred mortgage shall be obtained, except as specified in § 67.41-3 or in the case of the forfeiture of the vessel or its sale by the order of any court of the United States or any foreign country.

(R.S. 4138, 4146, as amended, 4170, as amended, 4322, 4324, 4325, as amended, sec. 27A, 72 Stat. 1736, sec. 30, subsec. O, 41 Stat. 1004, as amended; 46 U.S.C. 16, 23, 39, 264, 266, 267, 883-1, 961)

§ 67.33-3 Report of lost, destroyed, or abandoned vessel.

If any documented vessel is lost, destroyed, or abandoned, the owner shall immediately report the fact to the Officer in Charge at the home port of the vessel.

§ 67.33-5 Change of vessel engine.

A marine document need not be surrendered because the engine of the vessel is changed, if there is no change in the rig, dimensions, or tonnage of the vessel, nor because of a change in the service of the vessel, when there is no change in trade. In such a case, a notation of the change shall be made on the marine document by an Officer in Charge and initialed by him.

§ 67.33-7 Appointment of a guardian or receiver.

A marine document need not be surrendered because of the appointment of a guardian or committee for the owner of the whole or any part of the vessel, nor because of the appointment of a receiver, either in bankruptcy or in equity, of the assets of the owner of the whole or any part of the vessel.

§ 67.33-9 Sale or transfer to an alien.

When a marine document is surrendered incident to the sale or other transfer of a vessel to an alien, if such transfer has been approved by the Maritime Administration in accordance with the requirements of law (see § 67.57-1), the following certificate shall be issued by the Officer in Charge concerned upon the presentation of the bill of sale or other evidence covering the transfer:

I, ————————, Officer in Charge, Marine Inspection, for the port of ————, State of ————, United States of America, do hereby certify that ————, No. ——, issued at ———— on ———— to the ————, official number ——, was this day surrendered at this port upon the transfer of the vessel to a subject of ————, which transfer was authorized by the Maritime Administration under its Transfer Order No. MA ——, dated ————.

As witness my hand this —— day of ————, 19—.

(Signed) ————————
Officer in Charge, Marine Inspection

(R.S. 4146, as amended; 46 U.S.C. 23)

§ 67.33-11 Penalty for neglecting to surrender marine document.

The penalty for neglecting to surrender a marine document when required by law is the forfeiture of all privileges and benefits of a vessel of the United States.

(R.S. 4169; 46 U.S.C. 38)

Subpart 67.35—Surrender of Temporary Marine Documents

§ 67.35-1 Temporary marine document.

Every marine document granted by the Officer in Charge at a port other than the home port shall be temporary (see § 67.07-1 and note 4 thereunder).

(R.S. 4159, 4161, 4168; 46 U.S.C. 29, 31, 37)

§ 67.35-3 Requirement for surrender.

(a) Every temporary marine document shall be surrendered to the Officer in Charge within 10 days after the arrival of the vessel at her home port and whenever the surrender of a permanent document is required (see Subpart 67.33).

(b) The term "arrival" in paragraph (a) of this section means the voluntary arrival of the vessel in the regular course of her employment.

(R.S. 4160, 4162, 4168, 4325, as amended; 46 U.S.C. 30, 32, 37, 267)

§ 67.35-5 Vessel covered by a preferred mortgage.

The approval of the Officer in Charge of the surrender of the marine document of a vessel covered by a preferred mortgage shall be obtained, except as specified in § 67.41-3.

(Sec. 30, subsec. O, 41 Stat. 1004, as amended; 46 U.S.C. 961)

Subpart 67.37—Rebuilt and New Vessels

§ 67.37-1 New vessel.

A vessel may be deemed to be a new vessel in a case in which it has been built entirely of new materials or in a case in which it has been built in whole or in part of old materials taken from another vessel provided no considerable part of the old material used has been left undisturbed or intact without being taken up, refitted, and reset.

§ 67.37-3 Rebuilt vessel.

A vessel may be deemed to have been rebuilt if any considerable part of the hull in its intact condition without having been broken up is built upon or substantially altered.

§ 67.37-5 Vessels subject to the provisions of this subpart.

The certificate of specifications and other papers specified in § 67.37-7 shall be required when:

(a) A new vessel is constructed in whole or in part of material taken from an old vessel;

(b) An existing vessel is rebuilt;

(c) In the case of a vessel of more than 500 gross tons, an addition or change in any major component of the hull or superstructure is made and such major component was not constructed in the United States, its Territories (not including trust territories), or its possessions;

(d) A vessel of more than 500 gross tons is otherwise so altered as to give rise to a reasonable belief that such vessel may have been rebuilt, unless such alteration was effected entirely in the United States, its Territories (not including trust territories), or its possessions; or

(e) It is desired, in the case of an unrigged wooden vessel, other than a foreign-built vessel (§ 67.01-5(i), class 9), that a notation be made in the publication. Merchant Vessels of the United States, as to rebuilding.

(Sec. 27, 41 Stat. 999, as amended, secs. 2, 3, 70 Stat. 544, as amended; 46 U.S.C. 883, 883a)

§ 67.37-7 Certificate of specifications and other papers.

The owner of a vessel subject to the provisions of § 67.37-5 shall submit through the Officer in Charge at the port where the vessel then is or next arrives thereafter to the Commandant the following:

(a) A certificate of specifications outlining the work performed on the vessel, showing the place where any such building or rebuilding was effected, and describing the extent to which old materials used were taken up, refitted, and reset or the extent to which parts of the old hull in its intact condition were used or built upon.

(b) Accurate sketches or blueprints illustrating the extent of the work performed when such sketches or blueprints are available.

(c) A certificate of the builder, which shall be on Form CG-1261 if the vessel is claimed to be new.

(d) In the case of an unrigged wooden vessel, the shipbuilder, in addition to certifying that the vessel is rebuilt and the date of completion and place of such rebuilding, shall certify that the vessel is sound and free from rotten or doted wood in its structural parts; that it is properly fastened and calked; and that it is as good as new in strength and seaworthiness.

(37 Stat. 189, as amended, sec. 27, 41 Stat. 998, as amended, secs. 2, 3, 70 Stat. 544, as amended; 46 U.S.C. 63, 883, 883a)

§ 67.37-9 Determination by Commandant.

The Commandant shall decide whether or not a vessel is to be considered new or rebuilt and, if either, that decision shall be reflected on the vessel's marine document.

§ 67.37-11 Name and official number.

A rebuilt vessel shall retain its name and official number and the date and place of rebuild shall be noted on its marine document. Upon a finding under this subpart that a vessel is new, an application shall be submitted for the award of an official number and all other requirements applicable in the case of any new vessel shall be met before a marine document is issued.

(R.S. 4179; 46 U.S.C. 50)

§ 67.37-13 Rebuilt vessels; coastwise privileges.

No vessel of more than 500 gross tons which has been rebuilt and has thereby lost its coastwise privileges (see § 67.01-9) shall be documented for nor permitted to engage in the coastwise trade. When it is claimed that any such rebuilt vessel has not lost its coastwise privileges by virtue of the provisions of section 4 of the Act of July 5, 1960 (sec. 4, 74 Stat. 321), the owner in support of such claim shall submit to the Officer in Charge concerned with the other papers required by § 67.37-7 a certified copy of the contract for rebuilding, showing the date of execution, and a certificate of the builder showing the date the work of rebuilding commenced and the date upon which such work was completed.

(Sec. 27, 41 Stat. 999, as amended, secs. 2, 3, 70 Stat. 544, as amended; 46 U.S.C. 883, 883a)

Subpart 67.39—Change of Build or Rig

§ 67.39-1 Alteration in form or tonnage; change in rig.

When a documented vessel is altered in form or tonnage by being lengthened, shortened, or built upon or changed from one denomination to another by a change in rig or fitting, the vessel shall cease to be deemed a vessel of the United States unless she is documented anew. Every such alteration of a vessel of more than 500 gross tons which is not effected entirely within the United States, its Territories (not including trust territories), or its possessions, including the construction of any major components of the hull or superstructure, shall be reported in accordance with the provisions of § 67.37-7.

(R.S. 4170, as amended, secs. 2, 3, 70 Stat. 544, as amended; 46 U.S.C. 39, 883a)

§ 67.39-3 Change in means of propulsion; description.

(a) When there is a change in the means of propulsion of a vessel as from steam engine to gas engine or any other alteration which may change the description, the marine document of the vessel shall be surrendered.

(b) When a vessel's engine is changed but there is no change in the type of motive power, no redocumentation is required unless the installation of the new engine changes the admeasured tonnage of the vessel.

(R.S. 4170, as amended; 46 U.S.C. 39)

Subpart 67.41—Exchange of Marine Documents

§ 67.41-1 General provisions.

Any enrolled and licensed or licensed vessel, other than a vessel documented under the Act of September 2, 1958 (46 U.S.C. 883-1), may be registered upon the surrender of her marine document to an Officer in Charge (see § 67.41-3). Except as specified in § 67.41-5, any registered vessel may likewise be enrolled and licensed or licensed.

(R.S. 4322, 4323, as amended, 4337, sec. 27A, 72 Stat. 1736; 46 U.S.C. 264, 265, 278, 883-1)

§ 67.41-3 Surrender of marine document of a vessel covered by a preferred mortgage.

(a) The approval of the Officer in Charge of the surrender of the marine document of a vessel covered by a preferred mortgage shall be obtained, except that approval is not required when one or more of the following is the cause for surrender:

(1) A renewal of license, including a case in which the former document is replaced by reason of the fact that all renewal spaces are filled;

(2) A change of document incident to a change of trade;

(3) A change to a permanent document on arrival of a vessel at its home port under a temporary document or the issuance of a permanent document to a vessel absent from its home port;

(4) The replacement or renewal of a lost, mislaid, or mutilated document (a document may be deemed to be mutilated when it has been partially burned, torn, soiled, or otherwise defaced so as to be unsuitable for the purpose for which it was issued);

(5) The replacement of a document issued in error or on an improper form; or

(6) The replacement of a document of a vessel owned by a corporation when the president or secretary whose name appears thereon dies, is removed, or resigns and there has been no change in ownership.

(b) When some cause for surrender of the marine document occurs other than one or more of those recited in paragraph (a) of this section, such as a change in ownership or home port, the approval of the Officer in Charge is required to the surrender for such additional cause.

(Sec. 30, subsec. O, 41 Stat. 1004, as amended; 46 U.S.C. 961)

§ 67.41-5 Restrictions.

(a) Neither enrollment nor license for the coasting trade or for the coasting trade and mackerel fishery shall be granted to a vessel prohibited by law from engaging in the coastwise trade. (See § 67.01-1 and Subparts 67.37, 67.63, and 67.65.)

(b) Neither enrollment nor license for the fisheries or for the coasting trade and mackerel fishery shall be granted to a vessel prohibited by law from engaging in the American fisheries. (See § 67.01-1 and Subpart 67.63.)

(c) Neither enrollment and license nor license shall be granted to any vessel having on board merchandise brought from a foreign port until such merchandise shall have been wholly unladen and the duties paid or secured.

§ 67.41-7 Registered vessel; affidavit of owner or master.

No registered vessel shall be permitted to exchange her marine document unless the Officer in Charge to whom application is made is satisfied by an affidavit of the owner or master that all equipments purchased and repairs made abroad within the year immediately preceding such application have been duly accounted for and the duties accruing thereon have been paid. If the master gives this affidavit, it shall be on Form CG-1305.

(R.S. 4330; 46 U.S.C. 272)

[CGFR 69-138, 34 FR 20105, Dec. 23, 1969; 35 FR 1104, Jan. 28, 1970]

§ 67.41-9 Exchange of marine document at a port other than the home port.

No vessel shall be permitted to exchange her marine document at a port other than the home port until the master has applied for the new marine document and has filed his affidavit that the ownership remains as stated in the document to be surrendered. Such affidavit shall be executed on Form CG-1305, which may be modified in appropriate cases by deletion of the matter pertaining to foreign equipment or repairs. If the exchange of documents is made at the home port, the oaths required by Subpart 67.21 shall be filed.

(R.S. 4323, as amended; 46 U.S.C. 265)

Subpart 67.43—Loss, Mutilation, or Destruction of Marine Document

§ 67.43-1 Lost, mutilated, destroyed, or mislaid marine document.

When the marine document of any vessel is lost, mutilated, destroyed, or mislaid, the master certifies such fact on Form CG-1305, and the oaths required by Subpart 67.21 are filed at the port of first arrival if that port is the vessel's home port, or the affidavit required by § 67.41-9 is filed at any other port of first arrival, the Officer in Charge shall issue a new marine document, which shall recite the fact that it replaces the one lost, mutilated, destroyed, or mislaid.

(R.S. 4167, 4326; 46 U.S.C. 36, 268)

§ 67.43-3 Marine document wrongfully withheld from the possession of the owner.

A marine document is held to be lost when it is wrongfully withheld from the possession of the owner. All questions of what constitutes a wrongful withholding shall be referred to the Commandant for determination.

Subpart 67.45—Sale or Transfer of Vessel

§ 67.45-1 Vessel ceases to be a vessel of the United States until documented anew.

Except as stated in Subpart 67.55, when a documented vessel is sold or transferred in whole or in part to a citizen, such vessel shall not be deemed a vessel of the United States until documented anew.

(R.S. 4170, as amended, 4312, sec. 9, 39 Stat. 730, as amended, 46 U.S.C. 39, 252, 808)

§ 67.45-3 Requirement for written instrument.

In the case of the sale, gift, or conveyance (including conveyance in trust) of the whole or any part of a documented vessel, a written instrument in the nature of a bill of sale, which may be on Form CG-1340, 1342, 1344, 1346, or 1356, and which shall recite in full the marine document last granted to the vessel before the execution of the instrument, shall be filed with the Officer in Charge before a new marine document is granted.

(R.S. 4170, as amended, 4312; 46 U.S.C. 39, 252)

[CGFR 69-138, 34 FR 20105, Dec. 23, 1969; 35 FR 1104, Jan. 28, 1970]

§ 67.45-5 Administration of the estate of a deceased owner.

When the owner of the whole or any part of a documented vessel dies and there is an administration of his estate, an authenticated copy of the letters of appointment of the personal representative of the deceased owner shall be filed with the Officer in Charge before a new marine document is granted to that personal representative or to any of his successors in interest. In such a case, before a new marine document for a vessel is granted to one who acquires an interest therein as the beneficiary under a will, to the person succeeding to the interest of the deceased owner in case of intestacy, or to any successor in interest of either of them, an authenticated copy of the decree of distribution shall be filed with the Officer in Charge. The filing of an authenticated copy of the certificate of death or of the will of the deceased owner shall not be required.

§ 67.45-7 Death intestate of an owner.

(a) In case of the death intestate of the owner of the whole or any part of a documented vessel, if there is no administration of his estate, the Officer in Charge shall forward to the Commandant a statement of all the facts and circumstances and, except as provided for in paragraph (b) of this section, an authenticated copy of the certificate of death of the owner, together with any documentary evidence in support of the claim of title presented to him, before a new marine document is granted to the next of kin of the deceased owner or to his successors in interest.

(b) If it is impossible to obtain an authenticated copy of the certificate of death of the deceased owner of the whole or any part of such a vessel for filing with the Officer in Charge as required by paragraph (a) of this section, other evidence of death of such deceased owner shall be filed with the Officer in Charge in lieu thereof.

§ 67.45-9 Sale or conveyance by a guardian or committee of the owner.

In case of the sale or conveyance of the whole or any part of a documented vessel by a guardian or committee of the owner thereof, an authenticated copy of the letters of guardianship and of the court order, if any, authorizing the transfer of title shall be filed before a new marine document is granted.

§ 67.45-11 Appointment of a trustee in bankruptcy.

In case of the appointment of a trustee in bankruptcy of the assets of the owner of the whole or any part of such a vessel, an authenticated copy of the order of the referee or court appointing him as such shall be filed with the Officer in Charge before a new marine document is granted.

§ 67.45-13 Recitation of marine document; when not required.

The certificates, letters, decrees, orders, and other evidence of title referred to in §§ 67.45-5 through 67.45-11 shall not be required to recite a marine document of the vessel concerned.

§ 67.45-15 Partnership; termination of or change in.

(a) In the case of the termination of a partnership owning an interest in a vessel because of the addition of a new member, the withdrawal of an old, or both, the death or bankruptcy of a partner, or for any other reason, a written instrument in the nature of a bill of sale, as provided for in § 67.45-3, shall be filed with the Officer in Charge before a new marine document is granted.

(b) In the case of a change in membership of a partnership owning an interest in a vessel without dissolution of the firm, there shall be filed with the Officer in Charge evidence satisfactory to him that there has been no such dissolution and a certificate as to the change which has occurred signed by one or more of the members of the partnership as so changed before a new marine document is granted.

Subpart 67.47—Recording of Bills of Sale and Mortgages

§ 67.47-1 Declaration of vendee, mortgagee, pledgee, or transferee.

When any bill of sale, mortgage, hypothecation, or conveyance of any interest in any vessel is presented to an Officer in Charge to be recorded,[7] the

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[7] "(a) No sale, conveyance, or mortgage which, at the time such sale, conveyance, or mortgage is made, includes a vessel of the United States, or any portion thereof, as the whole or any part of the property sold, conveyed, or mortgaged shall be valid, in respect to such vessel, against any person other than the grantor or mortgagor, his heir or devisee, and a person having actual notice thereof, until such bill of sale, conveyance, or mortgage is recorded in the office of the Collector of Customs [now Officer in Charge] of the port of documentation of such vessel, as provided in subsection (b) of this section.

(b) Such Collector of Customs [now Officer in Charge] shall record bills of sale, conveyances, and mortgages delivered to him, in the order of their reception, in books to

Continued

vendee, mortgagee, pledgee, or transferee shall file with the Officer in Charge the declaration required by section 40, Shipping Act, 1916 (46 U.S.C. 838). The declaration of a corporation shall be signed by its president, secretary, or treasurer, or any other official thereof duly authorized by such corporation to execute any such declaration.

(Sec. 40, 40 Stat. 902, as amended; 46 U.S.C. 838)

§ 67.47-3 Approval of the designation of home port and documentation.

No bill of sale, mortgage, hypothecation, or conveyance of any interest in any vessel shall be accepted for recording prior to the receipt by the Officer in Charge of the approval of the designation of the home port; nor unless the vessel affected is documented as a vessel of the United States or will be so documented substantially simultaneously with the recording of the instrument.

(Sec. 30, subsec. C, 41 Stat. 1000, sec. 2, 43 Stat. 948; 46 U.S.C. 921, 1012)

§ 67.47-5 Multiple changes in ownership; recording of bills of sale.

If there has been more than one change in ownership of any interest in a vessel and the vessel has not been documented by the intermediate owners, all unrecorded bills of sale which are executed in the form and manner prescribed by this subpart may be recorded upon documentation of the vessel.

(Sec. 30, subsec. C, 41 Stat. 1000, sec. 2, 43 Stat. 948; 46 U.S.C. 921, 1012)

§ 67.47-7 Acceptance of mortgage for recording.

No mortgage shall be accepted for recording unless the vessel it covers was documented as a vessel of the United States at the time the mortgage was made. Any mortgage presented for recording may be on Form CG-1348.

(Sec. 30, subsec. C, 41 Stat. 1000; 46 U.S.C. 921)

§ 67.47-9 Recording and validity of instruments.

No bill of sale, mortgage, hypothecation, or conveyance of any interest in any vessel shall be valid against any person other than the vendor, mortgagor, pledgor, grantor, the heirs or devisees of any of the foregoing, or a person having actual notice thereof, unless the instrument has been recorded in the office of the Officer in Charge at the home port of the vessel. If the instrument covers more than one vessel, it shall be recorded at the home port of each vessel and indexed under the name of each vessel whose home port is the port of recordation. The Officer in Charge shall record all such instruments and certificates of discharge of mortgages in the order of their receipt in books to be kept for that purpose and hereafter indexed on Form CG-1332 to show:

(a) The name of the vessel;

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be kept for that purpose and indexed to show—

(1) The name of the vessel;

(2) The names of the parties to the sale, conveyance, or mortgage;

(3) The time and date of reception of the instrument;

(4) The interest in the vessel so sold, conveyed, or mortgaged; and

(5) The amount and date of maturity of the mortgage." (46 U.S.C. 921)

"(a) No bill of sale, conveyance, or mortgage shall be recorded unless it states the interest of the grantor or mortgagor in the vessel, and the interest so sold, conveyed, or mortgaged.

(b) No bill of sale, conveyance, mortgage, notice of claim of lien, or certificate of discharge thereof, shall be recorded unless previously acknowledged before a notary public or other officer authorized by a law of the United States, or of a State, Territory, District, or possession thereof, to take acknowledgment of deeds.

(c) In case of a change in the port of documentation of a vessel of the United States, no bill of sale, conveyance, or mortgage shall be recorded at the new port of documentation unless there is furnished the Collector of Customs [now Officer in Charge] of such port, together with the copy of the bill of sale, conveyance, or mortgage to be recorded, a certified copy of the record of the vessel at the former port of documentation furnished by the Collector of Customs [now Officer in Charge] of such port. The Collector of Customs [now Officer in charge] at the new port of documentation is authorized and directed to record such certified copy. * * *" (46 U.S.C. 926)

(b) The names of the parties to the instrument;

(c) The kind and date of the instrument;

(d) The interest transferred, mortgaged or discharged;

(e) The date, hour, and minute the instrument was received;

(f) The book in which the instrument is recorded;

(g) The number assigned to the instrument;

(h) In the case of a bill of sale or conveyance, the consideration stated in the instrument; and

(i) In the case of a mortgage or certificate of discharge of mortgage, the amount and date of maturity of the mortgage.

(Sec. 30, subsecs. C, H, 41 Stat. 1000, 1002, sec. 2, 43 Stat. 948; 46 U.S.C. 921, 926, 1012)

§ 67.47-11 Recitation of interest and name of transferee or mortgagee.

Each bill of sale, mortgage, hypothecation, or conveyance of any interest in any vessel shall recite the interest of the grantor or mortgagor in the vessel, the names of the persons to whom the interest has been transferred or mortgaged, and the interest transferred or mortgaged to each.

(Sec. 30, subsecs. C, H, 41 Stat. 1000, 1002; 46 U.S.C. 921, 926)

§ 67.47-13 Recitation of last marine document.

A bill of sale or conveyance shall recite in full the last marine document of the vessel. A mortgage, whether ordinary or preferred, may, but need not necessarily, recite in full the last marine document of the vessel; if such marine document is not recited, the vessel shall be described by rig, name, official number, and gross tonnage.

(R.S. 4170, as amended, 4312; 46 U.S.C. 39, 252)

§ 67.47-15 Decrees of distribution, trustees in bankruptcy, and orders of courts of record.

(a) The Officer in Charge shall index on Form CG-1332 all decrees of distribution of estates of deceased owners, all orders of referees or courts appointing trustees in bankruptcy, and all orders of courts of record having the effect of transferring any interest in a vessel or discharging a mortgage or lien to show:

(1) The name of the vessel;

(2) The name of the former owner;

(3) The name of the new owner;

(4) The interest transferred or lien discharged;

(5) The name of the court;

(6) The title of the case, and

(7) The date of the order.

(b) No certificate of death of the owner of any interest in a vessel, letters of appointment of the personal representative of a deceased owner, decree of distribution of the estate of a deceased owner, will of a deceased owner, letters of guardianship appointing a guardian or committee of an owner, order of a referee or court appointing a trustee in bankruptcy of the assets of an owner, nor court order authorizing the transfer of title of any interest in a vessel shall be recorded unless incorporated in a bill of sale, mortgage, hypothecatin, or conveyance of an interest in a vessel of the United States.

(Sec. 30, subsec. C, 41 Stat. 1000; 46 U.S.C. 921)

§ 67.47-17 Instruments to be acknowledged.

No bill of sale, conveyance, mortgage, release from mortgage, satisfaction or discharge of mortgage, assignment of mortgage, or certificate of discharge of lien shall be recorded unless previously acknowledged. Any acknowledgment valid under the laws of the State where made may be accepted. No officer or employee of the Coast Guard is authorized to take such acknowledgments.

(Sec. 30, subsec. H, 41 Stat. 1002; 46 U.S.C. 926)

§ 67.47-19 Certificate of discharge of mortgage; form.

Each certificate of discharge of mortgage presented for recording shall be on Form CG-1363 or in a substantially similar form.

§ 67.47-21 Endorsement by Officer in Charge on recorded instruments.

Each bill of sale, mortgage, hypothecation, conveyance, release, satisfaction, assignment, or notice of claim of lien shall be endorsed by the Officer in Charge to show the port of recordation, the exact day, hour, and minute it was received for recordation, the book in which it was recorded, and the number assigned to the instrument.

§ 67.47-23 Number of copies required.

When an instrument other than a preferred mortgage or assignment of a preferred mortgage (see Subpart 67.49) is to be recorded, the original and one copy shall be presented to the Officer in Charge, who shall retain the copy for his files.

§ 67.47-25 Abstract of title furnished by an Officer in Charge.

Any abstract of title of a vessel furnished by the Officer in Charge at the home port of the vessel shall be on Form CG-1332 and shall include any entry respecting each instrument required to be indexed under the regulations contained in this part, including a notice of claim of lien (§ 67.49-19(b)).

(Sec. 30, subsecs. C, H, 41 Stat. 1000, 1002; 46 U.S.C. 921, 926)

§ 67.47-27 Forwarding of abstract of title to new home port.

(a) When the home port of a vessel is changed, whether or not any change in title occurs, the Officer in Charge at the old home port, upon request of the owner of the vessel, shall forward in duplicate to the Officer in Charge at the new home port an abstract of title of the vessel, which shall bear at the end thereof the following endorsement:

I certify that the foregoing, which is issued in accordance with the provisions of 67.47-27(a), Coast Guard Regulations, incident to a change in home port, is a true abstract of title of the vessel described above, as appears by the records of this office.

———————————————
Documentation Officer
Port———————
Date———————

(b) When an abstract of title of a vessel is forwarded to the Officer in Charge at the new home port of a vessel in accordance with paragraph (a) of this section, the following endorsement shall be made in the index after the last entry for that vessel, and thereafter no instrument for such vessel shall be recorded at the old home port and no entry shall be made in the index with respect to any decree of distribution or order appointing a trustee in bankruptcy:

An abstract of title of the vessel described above was forwarded to the Officer in Charge at ——————— on this date in accordance with the provisions of § 67.47-27(a) of the Coast Guard Regulations.

———————————————
Documentation Officer
Date ———————

(Sec. 30, subsec. H, 41 Stat. 1002; 46 U.S.C. 926)

§ 67.47-29 Recording abstract of title at new home port.

The Officer in Charge at the new home port of a vessel shall record the abstract of title of the vessel forwarded to him in accordance with § 67.47-27(a), and no bill of sale, mortgage, hypothecation, conveyance, release, satisfaction, assignment, notice of claim of lien, court order conveying title or other instrument shall be recorded at the new home port until such abstract has been received and recorded.

(Sec. 30, subsec. H, 41 Stat. 1002; 46 U.S.C. 926)

§ 67.47-31 Abstract of title furnished upon request to any person.

(a) Whenever requested the Officer in Charge at the home port of any vessel shall furnish to any person an abstract of title of that vessel, which shall bear at the end thereof the following endorsement:

I hereby certify that the foregoing, which is issued in accordance with the provisions of § 67.47-31(a) of the Coast Guard Regulations, and which is not for record, is a true abstract of title of the vessel described above, as appears by the records of this office.

———————————————
Documentation Officer
Port ———————
Date———————

(b) No abstract of title of any vessel issued in accordance with paragraph

(a) of this section shall be recorded by any Officer in Charge, nor shall any endorsement be made in the index when such an abstract is furnished to any person.

Subpart 67.49—Preferred Mortgages

§ 67.49-1 Requirements.

(a) For the purposes of this subpart a "preferred mortgage" is one which meets the requirements of subsection D of the Ship Mortgage Act.[8]

(b) A preferred mortgage may not be placed upon any vessel which is not a documented vessel, nor upon any vessel of less than 25 gross tons which is a towboat (including tugs and other vessels used for towing), barge, scow, lighter, car float, canal boat, or tank vessel. It may cover more than one vessel, but may not be limited to a part of any vessel. (Section 1(b), Pub. L. 87-303, approved September 26,

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[8] "(a) A valid mortgage which at the time it is made, includes the whole of any vessel of the United States (other than a towboat, barge, scow, lighter, car float, canal boat, or tank vessel, of less than 25 gross tons), shall, in addition, have, in respect to such vessel and as of the date of the compliance with all the provisions of this subsection the preferred status given by the provisions of section 953 of this title, if—

"(1) The mortgage is endorsed upon the vessel's documents in accordance with the provisions of this section;

"(2) The mortgage is recorded as provided in section 921 of this title, together with the time and date when the mortgage is so endorsed;

"(3) An affidavit is filed with the record of such mortgage to the effect that the mortgage is made in good faith and without any design to hinder, delay, or defraud any existing or future creditor of the mortgagor or any lienor of the mortgaged vessel;

"(4) The mortgage does not stipulate that the mortgagee waives the preferred status thereof; and

"(5) The mortgagee is a citizen of the United States and for the purposes of this section the Reconstruction Finance Corporation shall, in addition to those designated in sections 888 and 802 of this title, be deemed a citizen of the United States.

"(b) Any mortgage which complies in respect to any vessel with the conditions enumerated in this section is hereafter in this chapter called a "preferred mortgage" as to such vessel.

"(c) There shall be endorsed upon the documents of a vessel covered by a preferred mortgage—

"(1) The names of the mortgagor and mortgagee;

"(2) The time and date the endorsement is made;

"(3) The amount and date of maturity of the mortgage; and

"(4) Any amount required to be endorsed by the provisions of subsection (e) or (f) of this section.

"(d) Such endorsement shall be made (1) by the Collector of Customs [now Officer in Charge] of the port of documentation of the mortgaged vessel, or (2) by the Collector of Customs [now Officer in Charge] of any port in which the vessel is found, if such Collector of Customs [now Officer in Charge] is directed to make the endorsement by the Collector of Customs [now Officer in Charge] of the port of documentation; and no clearance shall be issued to the vessel until such endorsement is made. Collector of Customs [now Officer in Charge] of the port of documentation shall give such direction by wire or letter at the request of the mortgagee and and upon the tender of the cost of communication of such direction. Whenever any new document is issued for the vessel, such endorsement shall be transferred to and endorsed upon the new document by the Collector of Customs [now Officer in Charge].

"(e) A mortgage which includes property other than a vessel shall not be held a preferred mortgage unless the mortgage provides for the separate discharge of such property by the payment of a specified portion of the mortgage indebtedness. If a preferred mortgage so provides for the separate discharge, the amount of the portion of such payment shall be endorsed upon the documents of the vessel.

"(f) If a preferred mortgage includes more than one vessel and provides for the separate discharge of each vessel by the payment of a portion of the mortgage indebtedness, the amount of such portion of such payment shall be endorsed upon the documents of the vessel. In case such mortgage does not provide for the separate discharge of a vessel and the vessel is to be sold upon the order of a district court of the United States in a suit in rem in admiralty, the court shall determine the portion of the mortgage indebtedness increased by 20 per centum (1) which, in the opinion of the court, the approximate value of the vessel bears to the approximate value of all the vessels covered by the mortgage, and (2) upon the payment of which the vessel shall be discharged from the mortgage." (46 U.S.C. 922)

1961 (75 Stat. 661), provides that the amendment reducing the minimum tonnage for preferred mortgages on certain classes of vessels from 200 to 25 gross tons under subsection (D) of the Ship Mortgage Act, 1920, as amended (46 U.S.C. 922), shall not apply to (1) any mortgage in existence on the date of enactment or (2) any mortgage placed on a vessel after the date of enactment under a mortgage on such vessel in existence on the date of enactment so long as such existing mortgage remains undischarged.)

(Sec. 30, subsec. D, 41 Stat. 1000, as amended; 46 U.S.C. 922)

§ 67.49-3 Mortgage including property other than a vessel.

A mortgage which includes property other than a vessel or vessels may not acquire a preferred status unless it provides for the separate discharge of such other property.

(Sec. 30, subsec. D, 41 Stat. 1000, as amended; 46 U.S.C. 922)

§ 67.49-5 Placing of more than one mortgage on a vessel.

A preferred or ordinary mortgage may be placed on a vessel already covered by a preferred or ordinary mortgage.

(Sec. 30, subsec. D, 41 Stat. 1000, as amended; 46 U.S.C. 922)

§ 67.49-7 Number of copies requried.

(a) Every preferred mortgage presented for recording shall be accompanied by three identical copies and, in the case of a blanket mortgage, one additional identical copy for each vessel in excess of one covered by the mortgage. All copies except one, which shall be inserted by the Officer in Charge in his record of preferred mortgages, shall be certified by the Officer in Charge and delivered to the mortgagor after the record has been made. The original shall be returned to the mortgagee and a receipt obtained.

(b) The mortgagor shall place, and use due diligence to retain, a certified copy of the preferred mortgage delivered to him pursuant to paragraph (a) of this section, on board the mortgaged vessel and cause such copy and the marine document of the vessel to be exhibited by the master to any person having business with the vessel, which may give rise to a maritime lien upon the vessel or to the sale, conveyance, or mortgage thereof. The master of the vessel shall, upon the request of any such person, exhibit to him the marine document of the vessel and the certified copy of any preferred mortgage of the vessel placed on board thereof. The requirement of this section that a copy of a preferred mortgage be placed and retained on board the mortgaged vessel shall not apply in the case of a mortgaged vessel which is not self-propelled (including but not limited to, barges, scows, lighters, and car floats).

(Sec. 30, subsecs. E, W, 41 Stat. 1001, as amended, 1006; 46 U.S.C. 923, 983)

§ 67.49-9 Affidavit of mortgagor.

The affidavit of the mortgagor required by subsection D(a)(3), of the Ship Mortgage Act, 1920 (see note 8, § 67.49-1(a)), if not included in the mortgage, shall be presented with each preferred mortgage submitted for recording and shall be retained by the Officer in Charge. Any acknowledgment of such affidavit valid under the laws of the State where made may be accepted. The Officer in Charge has no duty to ascertain whether there is any encumbrance on a vessel for which a preferred mortgage is presented to him for recording.

(Sec. 30, subsec. D, 41 Stat. 1000, as amended; 46 U.S.C. 922)

§ 67.49-11 Denial of clearance of vessel.

No vessel covered by a preferred mortgage shall be granted clearance at any port until the preferred mortgage endorsement required by subsection D(c) of the Ship Mortgage Act, 1920 (see note 8, § 67.49-1(a)), has been placed on her marine document.

(Sec. 30, subsec. D, 41 Stat. 1000, as amended; 46 U.S.C. 922)

§ 67.49-13 Endorsement on marine document; indexing on abstract of title.

In addition to the matters required by § 67.47-9, the Officer in Charge shall note on the index on Form CG-1332 the day, hour, and minute that:

(a) The proposed mortgage endorsement is placed on the marine document, and

(b) Such notation was made on the index.

(Sec. 30, subsecs. C, D, 41 Stat. 1000, as amended; 46 U.S.C. 921, 922)

§ 67.49-15 Surrender of marine document bearing a preferred mortgage endorsement.

When a marine document bearing a preferred mortgage endorsement is surrendered (see § 67.41-3) and a new marine document is issued before the mortgage is satisfied or the vessel released, the endorsement shall be placed on the new document.

(Sec. 30, subsecs. D, O, 41 Stat. 1000, as amended, 1004, as amended; 46 U.S.C. 922, 961)

§ 67.49-17 Assignment, amendment, assumption, or novation of a preferred mortgage.

For the purposes of this subpart an assignment, amendment, assumption, or novation of a preferred mortgage shall be regarded in all respects as a new preferred mortgage. The preferred mortgage endorsement respecting the recording of such an assignment, amendment, assumption, or novation shall be entered on the marine document of the vessel by a notation along the left-hand margin of the original endorsement. Such notation shall specify the date, port, time of endorsement, and nature of the instrument. If the instrument is an amendment, the items amended shall be shown in the notation; if other than an amendment, the names of the new parties shall be shown. If the endorsement is made at the request of a documentation officer at another port, the title of the requesting officer and the name of the port shall be shown.

(Sec. 30, subsec. W, 41 Stat. 1006; 46 U.S.C. 983)

§ 67.49-19 Notice of claim of lien.

(a) A notice of claim of lien upon a vessel shall be recorded only if the vessel is covered by a preferred mortgage and if the notice has been acknowledged.[9] Any acknowledgment valid under the laws of the State where made may be accepted. No officer or employee of the Coast Guard is authorized to take such acknowledgments.

(b) Each notice of claim of lien and certificate of discharge of lien presented to an Officer in Charge shall be recorded in a book to be kept for that purpose and indexed on Form CG-1332.

(Sec. 30, subsecs. G, H, 41 Stat. 1002; 46 U.S.C. 925, 926)

§ 67.49-21 Discharge of mortgage.

When a preferred mortgage has been discharged in whole or in part and a certificate of such discharge has been filed with the Officer in Charge at the home port of any vessel covered by the discharge, the Officer in Charge at the home port, or the Officer in Charge at the port where the vessel is, at the direction of the Officer in Charge at the home port, shall endorse the fact of such discharge upon the marine document of the vessel. No clearance shall be granted to such vessel until such endorsement has been made.[10]

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[9] "The Collector of Customs [now Officer in Charge] of the port of documentation shall upon the request of any person, record notice of his claim of a lien upon a vessel covered by a preferred mortgage, together with the nature, date of creation, and amount of the lien, and the name and address of the person. Any person who has caused notice of his claim of lien to be so recorded shall, upon a discharge in whole or in part of the indebtedness, forthwith file with Collector of Customs [now, Officer in Charge] a certificate of such discharge. The Collector of Customs [now, Officer in Charge] shall thereupon record the certificate." (46 U.S.C. 925(a))

[10] "The mortgagor, upon a discharge in whole or in part of the mortgage indebtedness, shall forthwith file with the Collector of Customs [now, Officer in Charge] for the port of documentation of the vessel, a certificate of such discharge. Such Collector of Customs [now, Officer in Charge] shall thereupon record the certificate. In case of a vessel covered by a preferred mortgage, Collector of Customs [now, Officer in Charge] at the port of documentation shall (1) endorse upon the documents of the

Continued

(Sec. 30, subsec. G, 41 Stat. 1002; 46 U.S.C. 925)

Subpart 67.51—Fee for Recording Instruments and Furnishing Certified Copies

§ 67.51-1 Bill of sale, conveyance, mortgage, or assignment of mortgage; recording fee.

The fee for recording a bill of sale, conveyance, mortgage, or assignment of mortgage shall be 20 cents for each folio of 100 words with a minimum fee of $1.

(Sec. 30, subsec. I, 41 Stat. 1002, as amended; 46 U.S.C. 927)

§ 67.51-3 Certified copies.

The fee for furnishing a certified copy of any bill of sale, conveyance, mortgage, assignment of mortgage, notice of claim of lien, certificate of discharge, or abstract of title shall be 20 cents for each folio of 100 words with a minimum fee of $1, except that if a person requesting certification of more than 10 copies of a mortgage which includes more than one vessel, furnishes such copies to the Officer in Charge, the fee for certification of each copy in excess of 10 shall be $1 per copy.

(Sec. 30, subsec. I, 41 Stat. 1002, as amended; 46 U.S.C. 927)

§ 67.51-5 Official documents.

The fee for furnishing a copy of an official document, including a marine document, not elsewhere enumerated in this subpart shall be 20 cents, when furnished to any person other than a Government officer, whether certified or not.

(R.S. 2654, as amended; 19 U.S.C. 58)

§ 67.51-7 Computation of fees.

(a) In computing the amounts to be collected under §§ 67.51-1 or 67.51-3:

(1) The word "folio" shall mean 100 words counting each figure as a word. No charge shall be made for fractions of a folio.

(2) When any instrument presented is not on an appropriate Coast Guard form, the number of folios shall be computed under the pertinent one of the following formulas:

(i) Except as specified in paragraph (a)(2)(iii) of this section, if the instrument is of less than 20 pages, the total number of lines shall be determined; the number of words in 10 percent of the lines of each size and style of writing or printing (handwritten, pica typewritten, elite typewritten, printed, etc.) shall be counted, using lines of average length; the average number of words per line of each size and style of writing or printing shall be multiplied by the total number of lines of such size and style in order to arrive at the total number of words; and that total shall be divided by 100 in order to ascertain the total number of folios.

(ii) Except as specified in paragraph (a)(2)(iii) of this section, if the instrument is of 20 pages or more, the number of words on a representative sample of pages (10 percent of the total, using pages of average width and length) shall be counted; the average number of words per page shall be multiplied by the number of pages in order to arrive at the total number of words; and that total shall be divided by 100 in order to ascertain the total number of folios.

(iii) If any such instrument contains a recitation or copy of a marine document of a vessel, whether reproduced by photostatic process or otherwise, the number of folios in such recitation or copy shall not be determined as specified in paragraph (a)(2) (i) or (ii) of this section, but instead each such recitation or copy shall be deemed to contain five folios. The number of folios contained in such recitation or copies, determined in accordance with this subdivision, shall be added to the number of folios contained in the remainder of such instrument, ascertained in accordance with paragraph (a)(2) (i) or (ii) of this section, as the case may be, and the sum shall be the total number of folios in that instrument.

(3) When any instrument presented is on one of the following Coast Guard

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vessel, or direct the Collector of Customs [now, Officer in Charge] at any port in which the vessel is found, to so endorse, the fact of such discharge, and (2) shall deny clearance to the vessel until such endorsement is made." (40 U.S.C. 925(b)) forms and contains only such written matter as is customarily used and necessary to complete and fill in the blanks on the form or when it contains such matter and other written matter interpolated or appended of less than 200 words, the number of folios in the instrument shall be deemed to be in accordance with the following schedule:

(i) Bill of sale of vessel on Form CG-1340, 1342, 1344, 1346, or 1356: 10 folios.

(ii) Mortgage of vessel on Form CG-1348—If marine document is not recited: 15 folios. If marine document is recited: 20 folios.

(iii) General Index or Abstract of Title on Form CG-1332: Five folios. When used as a continuation sheet: One folio for each two instruments noted thereon.

(4) When any such instrument is prepared on a Coast Guard form and contains such written matter as is customarily used and necessary to complete and fill in the blanks on the form and other written matter interpolated or appended of 200 or more words, the number of folios in the instrument shall be computed on the basis of the schedule in paragraph (a)(3) of this section for the printed forms, plus an additional amount for all the written matter other than such as is used and necessary to complete and fill in the blanks on the form in the customary manner, which amount shall be computed as though that portion of the instrument were not on a Coast Guard form.

(b) The number of folios in a certified copy of any instrument furnished under § 67.51-3 shall be computed in the same manner as in the case of the original, except that the number of folios in a certificate of discharge on Form CG-1363 shall be deemed to be five, unless the form contains interpolated or appended written matter of 200 or more words in addition to such written matter as is customarily used and necessary to complete and fill in the blanks on the form, in which case the fee shall be computed on the basis of a charge for three folios for the printed form, plus an additional amount for all the written matter other than such as is used and necessary to complete and fill in the blanks on the form in the customary manner, which amount shall be computed as though that portion of the instrument were not on a Coast Guard form. The fee shall not be collected for a duplicate certified abstract of title at the former home port issued in accordance with § 67.47-27(a).

(Sec. 501, 65 Stat. 290, sec. 30, subsec. I, 41 Stat. 1002, as amended; 31 U.S.C. 483a, 46 U.S.C. 927)

Subpart 67.53—Issue of Temporary Marine Document Upon Sale of Vessel

§ 67.53-1 By whom issued.

When a vessel entitled to be documented changes ownership and is in a port other than the home port designated by the new owner, a temporary marine document may be issued by the Officer in Charge at the port where she is.

(R.S. 4159; 46 U.S.C. 29)

§ 67.53-3 Application for temporary marine document at the vessel's home port.

If application is made to the Officer in Charge at the home port designated by the new owner and all requirements of law are complied with except the issuance of the marine document, he shall authorize the Officer in Charge at the port where the vessel then is to issue a temporary marine document to the vessel.

(R.S. 4159; 46 U.S.C. 29)

§ 67.53-5 Application for temporary marine document at other than the vessel's home port.

If application is made to the Officer in Charge at the port where the vessel then is, the same proceedings shall be had as are required by law at the vessel's home port, except that the bill of sale shall not be recorded at the port where the vessel is. If the bill of sale is presented to the Officer in Charge at the port where the temporary marine document is issued, it shall be noted on his records and then forwarded to the Officer in Charge at the home port designated by the new owner.

The recording fees shall be collected by the issuing Officer in Charge and forwarded with the bill of sale to the Officer in Charge at such home port.

(R.S. 4159, sec. 30, subsecs. H, W, 41 Stat. 1002, 1006, sec. 2, 43 Stat. 948; 46 U.S.C. 29, 926, 983, 1012)

§ 67.53-7 Recording bill of sale at the home port.

The bill of sale shall be recorded by the Officer in Charge at the home port designated by the new owner, but only after that Officer in Charge has received from the Officer in Charge at the former home port and recorded the abstract of title of the vessel as required by § 67.47-29.

(Sec. 30, subsecs. C, H, 41 Stat. 1000, 1002, sec. 2, 43, Stat. 948; 46 U.S.C. 921, 926, 1012)

§ 67.53-9 Surrender of temporary marine document.

The temporary marine document shall be surrendered within 10 days after the arrival of the vessel within the marine inspection zone to which she belongs.

(R.S. 4160; 46 U.S.C. 30)

Subpart 67.55—Sale Abroad

§ 67.55-1 Applicability.

A documented vessel which, while outside the limits of a marine inspection zone of the United States, is sold or transferred in whole or in part to a citizen of the United States may be documented anew as a vessel of the United States at the port designated as the vessel's home port by the new owner or owners in accordance with the requirements of Subpart 67.19. Such a marine document shall be issued upon compliance with all the applicable requirements contained in this part, and upon surrender of the previous marine document at the new home port except that (a) any marine document so issued shall be a permanent marine document and (b) the marine document may be issued without first requiring surrender of the outstanding marine document to the Officer in Charge in a case in which the vessel is at sea at the time. In such latter case, the new marine document shall be forwarded to the U.S. foreign service officer at the vessel's foreign port of call or the Officer in Charge at a domestic port of call upon request of the owner or his agent. The foreign service officer or the Officer in Charge to whom the new marine document is forwarded shall deliver that marine document to the vessel upon the vessel's arrival in port and upon surrender of the previous marine document, which shall be forwarded by the officer to the Officer in Charge at the vessel's home port.

(Sec. 2, 23 Stat. 118, as amended, R.S. 4166, as amended; 46 U.S.C. 2, 35)

§ 67.55-3 Failure to redocument; privileges as a vessel of the United States.

A documented vessel which has been sold or transferred in whole or in part to a citizen while abroad and which is not redocumented under § 67.55-1 shall nevertheless be entitled on her first arrival thereafter to all the privileges of a vessel of the United States.

(R.S. 4166, as amended; 46 U.S.C. 35)

Subpart 67.57—Sale or Charter to an Alien

§ 67.57-1 Consent of the Maritime Administration.

Unless the consent of the Maritime Administration is first obtained, no vessel of the United States may be sold or chartered in whole or in part to any person who is not a citizen or to any corporation, partnership, or association which is not a citizen as defined in section 2 of the Shipping Act, 1916, as amended (46 U.S.C. 802).

(Sec. 9, 39 Stat. 730, as amended; 46 U.S.C. 808)

§ 67.57-3 Surrender of marine document upon sale.

When a documented vessel is sold in whole or in part, even in trust or confidence, to one who is not a citizen, its marine document shall be delivered (a) within 7 days after the sale to the Officer in Charge at the port where the vessel is, if it is in the United States, or (b) within 8 days after the first arrival of the master in the United States to the Officer in Charge at the port of his first arrival, if the vessel is at sea or not in the United States at the time of sale.

(R.S. 4146, as amended, 4172; 46 U.S.C. 23, 41)

§ 67.57-5 Charter to an alien; citizenship of master and watch officers.

The master and all watch officers of a documented vessel chartered to one who is not a citizen shall be citizens.

(R.S. 4131, as amended, sec. 2, 38 Stat. 699; 46 U.S.C. 221, 236)

Subpart 67.59—Certificate of Ownership

§ 67.59-1 Form.

The certificate of ownership provided for in subsection I of the Ship Mortgage Act, 1920,[11] shall be executed on Form CG-1330.

(Sec. 30, subsecs. I, W, 41 Stat. 1002, as amended, 1006; 46 U.S.C. 927, 983)

§ 67.59-3 Fee.

The fee for issuance of a certificate of ownership shall be 20 cents for each folio of 100 words with a minimum fee of $1.

(Sec. 30, subsec. I, 41 Stat. 1002, as amended; 46 U.S.C. 927)

Subpart 67.61—Frontier Enrollment and License

§ 67.61-1 Foreign trade, coastwise trade, and fisheries.

Vessels under frontier enrollment and license[12] may engage in foreign or coastwise trade or the fisheries in waters covered by the license.

(R.S. 4318, as amended, 4321, as amended; 46 U.S.C. 258, 263)

§ 67.61-3 Restrictive endorsements.

In similar cases frontier enrollments shall bear the same endorsements as are placed on registers. When the endorsement required by § 67.01-7(a)(1), or § 67.01-9(b) is placed on a frontier enrollment and license, the word "Coasting" in the license shall be deleted, and the word "Fisheries" inserted in lieu thereof. When the endorsement required by § 67.01-7(b) is placed on a frontier enrollment and license, the words "and Foreign" in the license shall be deleted.

(R.S. 4318, as amended, sec. 27A, 72 Stat. 1736; 46 U.S.C. 258, 883-1)

§ 67.61-5 Foreign-built vessels.

A foreign-built vessel which is owned by a citizen but which was not so owned and documented prior to February 1, 1920, or which was not owned by the United States on June 5, 1920, shall not be granted a frontier enrollment and license, but shall be registered. (See § 67.63-9(b).)

(R.S. 4132, as amended; 46 U.S.C. 11)

§ 67.61-7 Yachts.

A yacht of less than 20 net tons enrolled and licensed to navigate the waters of the northern, northeastern, and northwestern frontiers otherwise than by sea shall not be required to surrender its enrollment and license and obtain a license when proceeding to ports in the United States, its Territories, or possessions, whether by sea or otherwise.

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[11] "Each Collector of Customs [now, Officer in Charge] shall permit records made under the provisions of this chapter to be inspected during office hours, under such reasonable regulations as the Collector of Customs [now, Officer in Charge] may establish. Upon the request of any person the Collector of Customs [now, Officer in Charge] shall furnish him from the records of the Collector's [now, Officer's in Charge] office (1) a certificate setting forth the names of the owners of any vessel, the interest held by each owner, and the material facts as to any bill of sale or conveyance of, any mortgage covering, or any lien or other incumbrance upon, a specified vessel, (2) a certified copy of any bill of sale, conveyance, mortgage, notice of claim of lien, or certificate of discharge in respect to such vessel, or (3) a certified copy as required by subsection (c) of section 926 of this title.* * *" (46 U.S.C. 927)

[12] "Any vessel of the United States, navigating the waters on the northern, northeastern, and northwestern frontiers, otherwise than by sea, shall be enrolled and licensed in such form as other vessels; such enrollment and license shall authorize any such vessel to be employed either in the coasting or foreign trade on such frontiers, and no certificate of registry shall be required for vessels so employed. Such vessel shall be, in every other respect, liable to the regulations and penalties relating to registered and licensed vessels." (46 U.S.C. 258)

(R.S. 4214, as amended, 4318, as amended; 46 U.S.C. 103, 258)

§ 67.61-9 Surrender of frontier enrollment and license.

Except as stated in § 67.61-7, when a vessel under frontier enrollment and license is to proceed to sea, directly or by way of an intermediate port, the vessel shall be required to surrender the frontier document. It may be issued a register if bound on a foreign voyage partly by sea, unless it is a vessel owned by a corporation which is a citizen of the United States as defined in § 67.03-7(a) (see §§ 67.01-7(b) and 67.07-11), or, if qualified, may be issued an enrollment and license when proceeding from one U.S. port to another by way of the St. Lawrence River and the sea without touching at any foreign port. A vessel is not considered to have touched at a foreign port by reason of being boarded by Canadian authorities for the purposes of inspecting the vessel and taking a passing report: *Provided*, That no business is transacted at the port or place of boarding. A vessel under frontier enrollment and license may retain that marine document when proceeding by way of the Hudson River to any U.S. port without going to sea.

(R.S. 4318, as amended, sec. 72A, 72 Stat. 1736; 46 U.S.C. 258, 883-1)

§ 67.61-11 Authority for issuance of frontier enrollment and license at a seaport.

The Officer in Charge at a seaport may issue a frontier enrollment and license.

(R.S. 4318, as amended; 46 U.S.C. 258)

Subpart 67.63—Registry of Foreign-Built Vessels

§ 67.63-1 Application for official number.

The application on Form CG-1320 for an official number for a foreign-built vessel (class 9, § 67.01-5(i)) shall state, in addition to the information therein required, the name of the former owner.

§ 67.63-3 Requirement for additional evidence.

(a) In lieu of the builder's certificate required for a vessel built in the United States, the application shall be accompanied by a photostatic or certified copy of the vessel's foreign register and of its foreign measurement certificate, if there be one, together with a duly authenticated translation of any such evidence that may be written in a foreign language.

(b) Satisfactory evidence shall be produced to establish that the transfer of registry has the approval of the foreign government concerned.

(c) If the vessel was built for the applicant and never under foreign registry, the builder's certificate shall be produced, but no approval of a foreign government shall be required. If the vessel was not built for the applicant, satisfactory evidence of ownership shall be produced as in the case of a vessel built in the United States.

(d) There shall also be produced a certificate of the Officer in Charge that the vessel is safe to carry dry and perishable cargo, and if the vessel is required to possess a certificate of inspection (see § 67.79-1), it shall be produced.

(R.S. 4132, as amended; 46 U.S.C. 11)

§ 67.63-5 Certificate of applicant.

The applicant shall submit a certificate stating that:

(a) The transfer of the vessel conveyed complete and unconditional title and ownership to the purchaser;

(b) There is no agreement or understanding reserving to the vendor, or to any person who is not a citizen, any interest in the vessel or its operations, or any right of control thereof;

(c) The transfer is intended to be permanent and not temporary, no right to repurchase the vessel is reserved to the vendor, and there is no understanding for its retransfer;

(d) The transfer was not made during a voyage of the vessel or while it was in a blockaded port; and

(e) The transfer was not made to avoid the consequences to which a vessel of a belligerent is exposed.

§ 67.63-9 Restrictive endorsements on marine documents.

(a) No foreign-built vessel owned and documented prior to February 1, 1920, by a citizen nor one owned by the United States on June 5, 1920, and sold to and owned by a citizen shall engage in the American fisheries, but it is otherwise unlimited as to marine documents and trade so long as it continues in such ownership. When a marine document is issued to such a vessel, the following notation shall be made thereon:

> As amended by section 5 of the Panama Canal Act and by the act of August 18, 1914, and sections 22, 27, and 38 of the Merchant Marine Act of June 5, 1920, as amended. This vessel shall not engage in the American fisheries.

If the vessel is owned by a corporation which is a citizen of the United States as defined in § 67.03-5 (a) or (b), the notation required by § 67.01-7(a) shall also be made on the marine document.

(b) A foreign-built vessel which is owned by a citizen, but which was not so owned and documented on February 1, 1920, or which was not owned by the United States on June 5, 1920, is limited to the foreign trade. A foreign-built vessel admitted to American registry and thereafter sold foreign in whole or in part or placed under foreign registry is limited, upon afterward becoming the property of a citizen, to the foreign trade. When a register is issued to a vessel of either such class, the following notation shall be made thereon:

> As amended by section 5 of the Panama Canal Act, by the act of August 18, 1914, by section 27 of the Merchant Marine Act of June 5, 1920, as amended, and by the act of May 24, 1938, entitling the vessel to engage only in trade with foreign countries or the islands of Guam, Tutuila, Wake, Midway, and Kingman Reef. This vessel shall not engage in the coastwise trade or the American fisheries.

(c) A foreign-built vessel which has been purchased from the Martime Administration or the War Shipping Administration by a citizen shall not engage in the American fisheries, but it is otherwise unlimited as to marine documents and trade so long as it continues in such ownership. When a marine document is issued to such a vessel, the following notation shall be made thereon:

> As amended by section 9 of the Shipping Act, 1916, as amended. This vessel shall not engage in the American fisheries.

If the vessel is owned by a corporation, the notation required by § 67.01-7(a) shall also be made on the marine document.

(R.S. 4132, as amended, sec. 22, 41 Stat. 997, secs. 2, 9, 39 Stat. 729, as amended, 730, as amended, sec. 27, 41 Stat. 999, as amended, sec. 27A, 72 Stat. 1736; 46 U.S.C. 11, 13, 802, 808, 883, 883-1)

Subpart 67.65—Documentation of American-Built Foreign-Flag Vessels

§ 67.65-1 Builder's certificate and certificate of admeasurement; when required.

In the case of an American-built foreign-flag vessel which has never been documented as a vessel of the United States, a builder's certificate shall be produced unless a certificate of record has been issued to the vessel previously. A certificate of admeasurement shall also be produced unless a certificate of record has been issued and the tonnage of the vessel has not since been changed. Application for an official number shall be made in accordance with § 67.63-1.

§ 67.65-3 Vessels formerly documented under United States flag.

In the case of an American-built foreign-flag vessel which was documented as a vessel of the United States before being placed under foreign flag, the production of a builder's certificate shall not be required, nor shall the production of a certificate of admeasurement unless the tonnage of the vessel has been changed. The official number originally awarded to the vessel shall be retained and the vessel shall be documented in the name under which it was last documented as a vessel of the United States.

§ 67.65-5 Application for documentation.

The application for documentation shall be accompanied by a photostatic or certified copy of the vessel's foreign register and foreign measurement certificate, if there be one, together with a duly authenticated translation of any such document that may be written in a foreign language. Satisfactory evidence shall be produced to establish that the transfer of registry has the approval of the foreign government concerned. If the vessel was not built for the applicant, satisfactory evidence of ownership shall be presented as in the case of a vessel of the United States.

§ 67.65-7 Certificate of applicant.

The applicant shall submit a certificate as required by § 67.63-5.

§ 67.65-11 Restrictive endorsement on marine document.

In appropriate cases, the notation required under § 67.01-9(b) shall be endorsed on a marine document issued under this subpart.

(R.S. 4132, as amended, sec. 27, 41 Stat. 999, as amended; 46 U.S.C. 11, 883)

Subpart 67.67—Foreign-Built Yachts

§ 67.67-1 Documentation of foreign-built yachts.

Any foreign-built yacht purchased by a citizen of the United States may be documented upon compliance with all the requirements set forth in Subpart 67.63. The Officer in Charge may then issue to any such yacht owned by a citizen a consolidated certificate of enrollment and yacht license on Form CG-1290 or, except upon the Great Lakes, a license of yacht under 20 net tons on Form CG-1288. Any marine document issued to such a yacht shall have written across its face the legend, "This vessel shall not engage in the coastwise trade or the American fisheries."

(R.S. 4132, as amended, 4214, as amended, 46 U.S.C. 11, 103)

§ 67.67-3 Certificate of protection.

Any foreign-built undocumented yacht owned by a citizen is entitled to legal protection as property of a citizen.[13] The Officer in Charge may issue to any such vessel a certificate that the bill of sale has been filed in his office and that it is valid in form and substance. This certificate shall be substantially in the following form:

FOREIGN-BUILT AMERICAN-OWNED YACHT

I, ——————————, Officer in Charge, Marine Inspection, for the port of ———— State of ————, United States of America, do hereby certify that the bill of sale, bearing date of ————, 19—, of the —————————— (Class and name) net tonnage, sold and transferred by ——————————, of ————, in ———— to ———— of ————, State of ————, United States of America, is in form and substance valid and effective in law; that it has been filed in this office; and that the said —————————— (Purchaser) is a citizen of the United States.

————, 19—.

——————————————————

Officer in Charge, Marine Inspection

(R.S. 4190, 46 U.S.C. 61)

Subpart 67.69—Record of American-Built Vessels Owned by Aliens

§ 67.69-1 Applicability.

A vessel built in the United States, never before documented, and belonging wholly or in part to an alien may be granted a certificate of record on Form CG-1316. Such a vessel may be documented as a vessel of the United States if transferred to a citizen.

(R.S. 4132, as amended, 4180, 4182, as amended; 46 U.S.C. 11, 54, 55)

§ 67.69-3 Requirement for builder's certificate and certificate of admeasurement.

Before a certificate of record is issued, a builder's certificate on Form CG-1261 and a certificate of admeasurement on Form CG-1414 shall be filed with the Officer in Charge.

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[13] "No document certifying or proving any vessel to be the property of a citizen of the United States shall be issued, except to vessels duly registered or enrolled and licensed as vessels of the United States, or to vessels which shall be wholly owned by citizens of the United States, and furnished with or entitled to customhouse documents." (46 U.S.C. 61)

(R.S. 4180, 4182, as amended; 46 U.S.C. 54, 55)

§ 67.69-5 Change of name or change of master of recorded vessel.

Whenever the master or name of a recorded vessel is changed, the Officer in Charge at the port where the vessel is, or the Officer in Charge at the port where the vessel next arrives if it is at sea or in a foreign port, shall endorse such change upon the certificate of record on the written application of one or more of the owners.

(R.S. 4183, as amended; 46 U.S.C. 56)

§ 67.69-7 Certificates of record.

Certificates of record shall be consecutively numbered. An exact copy of each certificate shall be placed in a permanent record kept for that purpose and a proper index made thereof on Form CG-124, appropriately modified (on Form CG-2112 at New York). When a recorded vessel is documented, the certificate of record shall be surrendered, canceled, and forwarded to the Commandant and the Officer in Charge at the port of issue shall be notified.

(R.S. 4180, 4182, as amended; 46 U.S.C. 54, 55)

§ 67.69-9 Documentation of recorded vessels.

In the documentation of a recorded vessel (class 3, § 67.01-5(c)), no builder's certificate shall be required. No admeasurement certificate shall be required unless the vessel has been altered since the certificate of record was issued.

Subpart 67.71—Prizes and Forfeited Vessels

§ 67.71-1 Documentation requirements.

If application is made for documentation of a vessel of class 4 or 5 (§ 67.01-5(d) or (e)), all the requirements relating to documentation, except the filing of a builder's certificate shall be complied with, and the Officer in Charge shall be furnished with a properly authenticated copy of the decree of condemnation and the proof of the applicant's ownership.

(R.S. 4132, as amended; 46 U.S.C. 11)

Subpart 67.73—Inspection of Marine Documents

§ 67.73-1 Production upon demand.

Whenever a vessel of the United States is in commission, its marine document shall be on board, shall be accessible to the master or other person in charge or command, and shall be produced to any officer entitled to inspect same upon demand,[14] except when the document is in the custody of the Officer in Charge for some required official purpose, or except in the case of a vessel within the purview of §§ 67.29-7 and 67.29-9.

(R.S. 4336, as amended; 46 U.S.C. 277)

Subpart 67.75—Change of Name of Documented Vessel

§ 67.75-1 Consent and approval for change of name.

The name of a documented vessel (including any documented yacht) shall not be changed except with the consent and approval of the Officer in Charge or documentation officer for the vessel's home port.[15]

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[14] "Any officer concerned in the collection of the revenue may at all times inspect the register or enrollment or license of any vessel or any document in lieu thereof; and if the master or other person in charge or command of any such vessel shall not exhibit the same, when required by such officer, unless the vessel is one which by regulation of the Secretary of the Treasury [now, the Secretary of Transportation] is not required to have its register or enrollment or license or document in lieu thereof on board, such master or person in charge or command shall be liable to a penalty of $100, unless the failure to do so is willful, in which case he shall be liable to a penalty of $1,000 and to a fine of not more than $1,000 or imprisonment for not more than one year, or both." (46 U.S.C. 277)

[15] "The Commissioner of Customs [now, Commandant] shall be empowered to change the names of vessels of the United States on application of the owner or owners of such vessels when in his judgment

Continued

(R.S. 4179, secs. 1, 2, 41 Stat. 436, as amended, 437, as amended; 46 U.S.C. 50, 51, 52)

§ 67.75-3 Application for change of name.

Each application for change of name shall be executed on Form CG-1323 by the owner or owners of the vessel and shall be submitted in duplicate to the documentation officer at the vessel's home port.

(Secs. 1, 2, 41 Stat. 436, as amended, 437, as amended; 46 U.S.C. 51, 52)

§ 67.75-5 Vessels covered by liens, mortgages, or other encumbrances of record.

In applicable cases there shall be filed with the documentation officer: (a) The consent of the mortgagee or other beneficiary under each lien, mortgage, or other encumbrance of record at the vessel's home port, and (b) any approval of the Officer in Charge required by subsection O(a), Ship Mortgage Act, 1920 (see § 67.41-3).

(Sec. 2, 41, Stat. 437, as amended; sec. 30, subsec. O, 41 Stat. 1004, as amended; 46 U.S.C. 52, 961)

§ 67.75-7 Approval or disapproval for change of name.

If the application is approved, the approving officer shall so indicate by a note in the appropriate space provided on Form CG-1323, deliver the original to the applicant, and retain the duplicate in the records of his office. If the application is disapproved, the applicant shall be notified in writing.

(Secs. 1, 2, 41 Stat. 436, as amended, 437, as amended; 46 U.S.C. 51, 52)

§ 67.75-9 Publication of change of name order.

The applicant shall cause notice of the order for the change of name to be published in some daily or weekly newspaper of general circulation at or nearest to the home port of the vessel in at least four consecutive issues. The notice shall be in the following form:

Notice is hereby given that an order dated ———— has been issued by the undersigned authorizing the name of the ———— (Rig) ———— (Name) official number ————, owned by ————, of which ———— is the home port, to be changed to ————.

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(Signature and title)

____

(Port)

(Sec. 2, 41 Stat. 437, as amended; 46 U.S.C. 52)

§ 67.75-11 Documentation of vessel in new name.

(a) No marine document shall be issued to the vessel in the new name until the applicant has paid the fee prescribed by § 67.75-19 and, except as specified in paragraph (b) of this section, until he has complied with § 67.75-9 and has furnished to the documentation officer at the vessel's home port (1) a declaration of publication signed by a proper representative of the newspaper in which the order for the change of name was published setting forth the wording of the order, the dates of publication, and the payment of the cost of advertising, or (2) a copy of each of the four consecutive issues of the newspaper in which the order appeared, together with a receipt for the payment of the cost of advertising.

(b) Documentation of the vessel in the new name shall not be withheld until notice of the order for the change has been published as required by § 67.75-9, if the documentation officer at the vessel's home port is satisfied that the contract for publication has been entered into and he has been furnished with a receipt for the payment of the cost thereof, but the applicant shall within a reasonable time

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there shall be sufficient cause for so doing. (46 U.S.C. 51)

"No master, owner, or agent of any vessel of the United States shall in any way change the name of such vessel, or by any device, advertisement, or contrivance deceive or attempt to deceive the public, or any officer or agent of the United States, or of any State, or any corporation or agent thereof, of any person or persons, as to the true name or character of such vessel, on pain of the forfeiture of such vessel." (46 U.S.C. 50) after publication furnish to the documentation officer the evidence prescribed in subparagraph (1) or (2) of paragraph (a) of this section.

(Secs. 2, 3, 41 Stat. 437, as amended; 46 U.S.C. 52, 53)

§ 67.75-13 Effective period of change of name order.

The order for change of name shall be effective only if the vessel is documented in the new name within a period of 6 months from the date of the order.

(Sec. 2, 41 Stat. 437, as amended; 46 U.S.C. 52)

§ 67.75-15 Change of ownership and change of name; simultaneous transactions.

If there is a change in ownership of a vessel and the new owner applies for a change of name of the vessel, his designation of home port shall be in the name under which the vessel was last documented. A designation of home port shall not be required to be submitted merely by reason of a change of name.

(R.S. 4170, as amended, sec. 2, 41 Stat. 437, as amended; 46 U.S.C. 39, 52)

§ 67.75-17 Requirement for redocumentation under former name.

(a) A vessel which is to be redocumented after being out of documentation shall be redocumented only under the name and official number in which it was last documented. However, if an application for a change in name is submitted simultaneously with an application for the redocumentation of such a vessel and the vessel is then marked with a name other than that under which it was last documented, and if the change of name is approved, the approving officer may issue the marine document in the old name and immediately issue the further document incident to the change in name without requiring that the vessel be marked with the name under which it was previously documented.

(b) Whenever any vessel documented or formerly documented as a vessel of the United States has been sold or transferred in whole or in part, or altered in tonnage, description, or rig, that vessel shall be documented anew only under the name in which it was last documented. However, if an application for change of name is submitted simultaneously, if the vessel is then marked with a name other than that in which it was last documented, and if the change in name is approved, the vessel may be documented anew without requiring the former name to be marked, provided the vessel is forthwith documented in the new name and provided that that name is then correctly marked on the vessel in compliance with the applicable requirements.

(c) The International Regulations for Preventing Collisions at Sea, which came into force on January 1, 1954, prescribe in Rule 31 that the signal of distress for ships with a radiotelephone is the spoken word "MAYDAY." The Coast Guard, as a matter of policy will not approve the use of a name, either in connection with an original documentation or an application for change of name of a documented vessel which is actually or phonetically identical with, or so similar as to be confused with, the International radiotelephone distress signal "MAYDAY."

(R.S. 4170, as amended, sec. 2, 41 Stat. 437, as amended; 46 U.S.C. 39, 52)

§ 67.75-19 Fee for change of vessel's name.

(a) When a change in the name of a vessel is approved, the following fees shall be paid by the owners of vessels to Officers in Charge: For a vessel of 99 gross tons or under, $10; for a vessel of 100 gross tons or up to and including 499 gross tons, $25; for a vessel of 500 gross tons or up to and including 999 gross tons, $50; for a vessel of 1,000 gross tons or up to and including 4,999 gross tons, $75; for a vessel of 5,000 gross tons or over, $100. The fee is due upon approval of the application whether or not the vessel is documented in the new name.

(b) The cost of advertising and of procuring any evidence required by this subpart shall be paid by the applicant.

(Secs. 2, 3, 41 Stat. 437, as amended; 46 U.S.C. 52, 53)

Subpart 67.77—Yacht Privileges and Obligations

§ 67.77-1 Documented yacht to be used exclusively for pleasure; exemption from entry and clearance.

A vessel documented as a yacht shall be used exclusively for pleasure and shall not transport merchandise nor carry passengers for pay. A vessel which is so documented and which is not engaged in any trade nor in any way violating the customs or navigation laws of the United States may proceed from port to port in the United States or to foreign ports without clearing and is not subject to entry upon its arrival in a port of the United States, provided it has not visited a hovering vessel.

(Secs. 434, 441, 46 Stat. 711, as amended, 712, as amended, R.S. 4214, as amended, sec. 4, 28 Stat. 625; 19 U.S.C. 1434, 1441, 46 U.S.C. 103, 107)

§ 67.77-3 Yacht commission.

(a) Upon the application of the owner on Form CG-1250, submitted through an Officer in Charge, a commission may be issued by the Commandant to any vessel licensed or enrolled and licensed as a yacht, belonging to a regularly organized and incorporated yacht club, to identify such yacht and its owner during a foreign voyage. A fee of $6 which shall accompany the application shall be paid for each yacht commission issued. This commission is a token of credit to any U.S. official and to the authorities of any foreign power for the privileges enjoyed under it.

(b) On the return to the United States of any yacht so commissioned, such commission shall be surrendered to the customs officer to whom the required report of arrival is made or to an Officer in Charge.

(R.S. 4217, as amended; 46 U.S.C. 105)

§ 67.77-5 Fees for the documentation of yachts.

(a) When a marine document is issued to a yacht, the owner shall pay a fee of $75 to the Officer in Charge.

(b) When a yacht's marine document is renewed, the owner shall pay a fee of $15 to the Officer in Charge.

(c) When a yacht's marine document is endorsed to reflect a change of master, the yacht owner shall pay a fee of $15 to the Officer in Charge.

(D.O.T. FY 81 Appropriations Act, Pub. L. 96-400, 94 Stat. 1681)

[46 FR 70262, Oct. 23, 1980]

Subpart 67.79—Certificates of Inspection

§ 67.79-1 Vessels to be inspected prior to documentation.

The following vessels shall undergo inspection by the proper officers and receive certificates of inspection before marine documents are issued to them:

(a) Every steam vessel over 65 feet in length, and every steam-propelled tugboat or towboat of any length, except public vessels of the United States, but including vessels owned or operated by the Maritime Administration or any corporation organized or controlled by it.

(b) Every vessel above 15 gross tons carrying freight for hire and every vessel of above 15 gross tons and in excess of 65 feet in length carrying passengers for hire, but not engaged in fishing as a regular business, propelled by gas, fluid, naphtha or electric motors. A motor vessel of 15 gross tons plus a fraction of a ton is considered to be over 15 gross tons.

(c) Every ferryboat, canal boat, yacht, or other small vessel of like character over 65 feet in length and propelled by steam.

(d) Every sail vessel over 700 tons carrying passengers for hire.

(e) Every seagoing barge of 100 gross tons or over.

(f) Every other vessel over 100 gross tons carrying passengers for hire.

(g) Every seagoing vessel of 300 gross tons and over, propelled in whole or in part by an internal-combustion engine, except those engaged in fishing, oystering, clamming, crabbing, or any other branch of the fishery or kelp or sponge industry.

(h) Every passenger-carrying vessel of a class set forth in paragraph (a), (b), or (c) of this section, when navigated on Irondequoit Bay, N.Y.

(i) Every vessel, regardless of tonnage, size, or means of propulsion, whether self-propelled or not, and whether carrying freight or passengers for hire or not, that shall have on board any inflammable liquid cargo in bulk, except public vessels owned by the United States and not engaged in commercial service.

(j) Every vessel carrying more than six passengers, except public vessels of the United States, but including vessels owned or operated by the Maritime Administration or any corporation organized or controlled by it, which is:

(1) Propelled in whole or in part by steam or by any form of mechanical or electrical power and is of 15 gross tons or less; or,

(2) Propelled in whole or in part by steam or any form of mechanical or electrical power and is of more than 15 gross tons and less than 100 gross tons and not more than 65 feet in length measured from end to end over the deck excluding sheer; or,

(3) Propelled by sail and is of 700 gross tons or less; or,

(4) Non-self-propelled and is of 100 gross tons or less.

(R.S. 4498, as amended; 46 U.S.C. 496)

Subpart 67.81—Revocation or Denial of Marine Document

§ 67.81-1 Procedure.

Before revoking the marine document of a vessel which is being, or is intended to be, used illegally,[16] the Officer in Charge shall present charges to the owner of the vessel and give such owner a reasonable time to reply; except that, if the evidence is practically conclusive and immediate action is necessary, the Officer in Charge shall forthwith revoke the marine document, subject to an appeal by the owner to the Commandant.

(Sec. 4, 49 Stat. 519, as amended; 19 U.S.C. 1704)

§ 67.81-3 Appeals.

Any appeal from a revocation or denial of a marine document by an Officer in Charge shall be in writing. It shall be filed in triplicate with the Officer in Charge, who shall retain one copy in his office. The owner may submit with his appeal corroborative evidence in the form of written statements from persons having actual knowledge of the facts, and, if pertinent, a detailed description and blueprints of the vessel. Such evidence, with two copies of the owner's appeal, shall be promptly forwarded to the Commandant, together with the report of the Officer in Charge, which shall present in detail the facts and evidence supporting his action and any additional comments he desires to make regarding any facts not before him at the time of his original action.

(Sec. 4, 49 Stat. 519, as amended; 19 U.S.C. 1704)

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[16] "Subject to appeal to the Secretary of the Treasury [now, Secretary of Transportation] and under such regulations as he may prescribe, whenever the Collector of Customs [now, Officer in Charge of the Marine Inspection Zone] in which any vessel is, or is sought to be, registered, enrolled, or licensed, or the Commandant of the Coast Guard in the case of any vessel which is, or is sought to be numbered, is shown upon evidence which he deems sufficient that such vessel is being or is intended to be, employed to smuggle, transport, or otherwise assist in the unlawful introduction or importation into the United States of any merchandise or person, or to smuggle any merchandise into the territory of any foreign government in violation of the laws there in force, if under the laws of such foreign government any penalty or forfeiture is provided for violation of the laws of the United States respecting the customs revenue, or whenever, from the design or fittings of any vessel or the nature of any repairs made thereon, it is apparent to such Collector or Commandant that such vessel has been built or adapted for the purpose of smuggling merchandise, the said Collector or Commandant shall revoke the registry, enrollment, license, or number of said vessel or refuse the same if application be made therefor, as the case may be. Such Collector or Commandant and all persons acting by or under his direction shall be indemnified from any penalties or actions for damages for carrying out the provisions of this section." (19 U.S.C. 1704)

Subpart 67.83—Report of Laid-up Vessels

§ 67.83-1 Annual report.

Each Officer in Charge shall submit to the Commandant a report of all vessels of the United States laid up in his Zone on December 31 of each year.

Subpart 67.85—Monthly Supplement to "Merchant Vessels of the United States"

§ 67.85-1 Subscriptions.

A charge of $5 shall be made for an annual subscription to the Monthly Supplement to "Merchant Vessels of the United States." Subscriptions shall be addressed to the Commandant and shall be accompanied by a remittance in that amount.

(Sec. 4, 23 Stat. 119, as amended; 46 U.S.C. 4)

Subpart 67.87—Registration of Private Code Signals, House Flags, and Funnel Marks

§ 67.87-1 Application for registration of private code signals.

Application for the registration of private code signals by rockets, lights, or other similar means shall be submitted in duplicate through the office of an Officer in Charge to the Commandant by the owner of the vessel or vessels by which they are to be used. The application shall describe in detail the signals which it is desired to use and shall state the purpose for which they will be used.

(Sec. 7, 35 Stat. 426, as amended; 46 U.S.C. 49)

§ 67.87-3 Application for registration of house flags or funnel marks.

Application for the registration of house flag or funnel mark, or both, shall be submitted in duplicate through the office of an Officer in Charge to the Commandant by the owner of the vessel or vessels on which they are to be used. The application for registration of a house flag shall describe such flag in detail, giving the colors, shape, and proportionate dimensions of the fly, field, union, or canton, and any insignia, markings, or stripes thereon in relation to the length of the hoist. Funnel marks shall be described in detail giving the colors to be used, the position of any insignia, markings, or stripes with relation to the top or collar of the funnel, the size of such insignia, markings, or stripes in relation to the diameter of the funnel, and the color of the remainder of the funnel. In addition there shall be submitted three replica drawings of the house flag or funnel, or both, drawn to scale, in the colors to be used, in ink, watercolor, oil pigments, or other permanent colors, and not exceeding 6 by 4 inches in size.

(Sec. 7, 35 Stat. 426, as amended; 46 U.S.C. 49)

§ 67.87-5 Registration.

Except as stated in § 67.87-7, upon filing of an application duly executed in accordance with § 67.87-1 or § 67.87-3, the Commandant will register private code signals by rockets, lights, or other similar means, house flags, and funnel marks, and will cause a description of such signals, flags, or funnel marks to be filed with the Office of the Federal Register, together with one replica drawing of the house flag or funnel mark, or both.

(Sec. 7, 35 Stat. 426, as amended; 46 U.S.C. 49)

§ 67.87-7 Refusal to register certain signals.

The Commandant will refuse to register any signals which in his opinion cannot easily be distinguished from signals of distress, signals for pilots, or signals prescribed by laws for preventing collisions. The Commandant will also refuse to register any signal, flag, or funnel mark which is identical or nearly identical with one previously registered.

(Sec. 7, 35 Stat. 426, as amended; 46 U.S.C. 49)

§ 67.87-9 Notice to applicants.

Applicants will be notified of the action of the Commandant through the office of the Officer in Charge transmitting the application.

(Sec. 7, 35 Stat. 426, as amended; 46 U.S.C. 49)

§ 67.87-11 Registration fee.

A fee of $40 shall be paid upon the registration of a house flag or funnel mark, or both and each application for such registration filed with an Officer in Charge shall be accompanied by a remittance in that amount.

(Sec. 501, 65 Stat. 290, sec. 7, 35 Stat. 426, as amended; 31 U.S.C. 483, 46 U.S.C. 49)

Subpart 67.90—Documentation of Vessels Under the Act of August 9, 1954

§ 67.90-1 Applicability.

Any vessel (except a vessel constructed under the provisions of the Merchant Marine Act, 1936, as amended), not documented under the laws of the United States, which is acquired by or made available to the Secretary of Commerce, may be documented under the Act of August 9, 1954.

(Secs. 1-3, 68 Stat. 675; 50 U.S.C. 196-198)

§ 67.90-3 Coastwise trade.

Vessels registered pursuant to this section shall not engage in the coastwise trade unless in possession of a valid unexpired permit to engage in that trade issued by the Secretary of Commerce under authority of section 3(c) of the Act of August 9, 1954.

(Sec. 3, 68 Stat. 675; 50 U.S.C. 198)

§ 67.90-5 Marine documents; enrollment and license or license.

Any vessel which is entitled under the provisions of § 67.90-1 to be registered may be enrolled and licensed if 20 net tons or over, or, if under 20 net tons, licensed for the coasting trade under the Act of August 9, 1954, provided a valid unexpired permit to engage in the coastwise trade issued by the Secretary of Commerce under the authority of section 3(c) of the Act of August 9, 1954, is filed with the Officer in Charge to whom application for enrollment and license or license is made.

(Sec. 3, 68 Stat. 675; 50 U.S.C. 198)

§ 67.90-7 Provisional register.

(a) Subject to prior authorization by the Commandant in each case, a consular officer of the United States, or the captain of the Port of Cristobal or Balboa, C.Z., may issue a provisional register to a vessel abroad which has been acquired by or made available to the Secretary of Commerce.

(b) A copy of every provisional register issued under this section shall be forwarded immediately by the issuing officer through the usual channels to the Commandant.

(c) Such provisional register shall entitle the vessel to the privilege of a vessel of the United States in trade with foreign countries, American Samoa, or the Island of Guam, until the expiration of 6 months from the date thereof, until 10 days after the vessel's arrival at a port in the United States, or until the effective date of an order of the Commandant requiring its surrender, whichever may happen first, and no longer.

(Sec. 3, 68 Stat. 675; 50 U.S.C. 198)

§ 67.90-9 Marine documents; classes; period of validity.

(a) Marine documents issued under the Act of August 9, 1954, shall consist of registers, enrollments and licenses, and licenses.

(b) All marine documents (except provisional registers) issued under the Act of August 9, 1954, shall be permanent, whether granted to vessels at their home ports or at ports other than their home ports.

(c) Every marine document issued under the Act of August 9, 1954, shall be valid until the effective date of an order of the Commandant requiring its surrender, unless sooner terminated as provided for in any of the provisions of this subpart.

(d) Any marine document issued under the Act of August 9, 1954, shall be valid only so long as the vessel to which it is granted is owned as, and of the description, stated therein.

(e) Any enrollment and license or license issued under the Act of August 9, 1954, shall be valid only so long as the permit issued to the vessel by the Secretary of Commerce remains in force.

(f) Any marine document issued under the Act of August 9, 1954, shall be surrendered at any time that such surrender may be ordered by the Commandant. No vessel, the surrender of the marine documents of which has been so ordered, shall have, after the effective date specified in such order, the status of a vessel of the United States unless documented anew.

(Sec. 3, 68 Stat. 675; 50 U.S.C. 198)

§ 67.90-11 Marine documents; execution of.

All marine documents issued under the Act of August 9, 1954, shall be executed as prescribed in § 67.07-5.

(Sec. 3, 68 Stat. 675; 50 U.S.C. 198)

§ 67.90-13 Marine documents to include dimensions and tonnage.

Every marine document issued to a vessel under the Act of August 9, 1954, shall, whenever possible express the data specified in § 67.07-9.

(Sec. 3, 68 Stat. 675; 50 U.S.C. 198)

§ 67.90-15 Application for official number and signal letters.

(a) Application for an official number for a vessel to be documented under the Act of August 9, 1954, shall be made in triplicate by the Secretary of Commerce and delivered to the Commandant directly or through the Officer in Charge at the home port, or through the Officer in Charge at the port at which the Secretary of Commerce intends to document the vessel. The application may contain a request that signal letters be awarded and shall show the following on its face or on an attachment when suitable spaces are not provided on the form for such information:

(1) That the United States represented by the Secretary of Commerce is the owner of the vessel.

(2) That the vessel is not documented under the laws of the United States.

(3) That it has been acquired by or made available to the Secretary, as the case may be.

(4) That it has not been constructed under the provisions of the Merchant Marine Act, 1936, as amended.

(5) The material of which the hull is constructed.

(6) The date and place of build of the vessel, if possible.

(7) The matters required by § 67.90-13 to be shown on the document.

(b) Official numbers issued to such vessels shall be prefaced by the letters MA. The issuance shall be as provided for in § 67.11-1(c).

(Sec. 3, 68 Stat. 675; 50 U.S.C. 198)

§ 67.90-17 Designation of home port.

Prior to documentation, the approval of the Commandant of the designation of home port shall be obtained by the Secretary of Commerce. The designation shall be made by the Secretary of Commerce in triplicate on Form CG-1319 and delivered to the Commandant directly or through the Officer in Charge at the home port so designated, or through the Officer in Charge at the port at which the Secretary of Commerce intends to document the vessel.

(Sec. 3, 68 Stat. 675; 50 U.S.C. 198)

§ 67.90-19 Coastwise permit.

Before an enrollment and license or license may be issued under the Act of August 9, 1954, there shall be filed with the Officer in Charge at the port at which the marine document is to issue a valid unexpired permit in duplicate issued by the Secretary of Commerce under authority of section 3(c) of the Act of August 9, 1954, authorizing the vessel to engage in the coastwise trade.

(Sec. 3, 68 Stat. 675; 50 U.S.C. 198)

§ 67.90-21 Marking of official number and net tonnage.

The official number and the net tonnage of every vessel documented under authority of the Act of August 9, 1954, shall be marked upon the main beam. Such marking shall not, however, be required prior to the issue of a marine document to the vessel.

(Sec. 3, 68 Stat. 675; 50 U.S.C. 198)

§ 67.90-23 Name and hailing port.

It is not necessary that the name and hailing port be marked prior to documentation on a vessel to be documented under this subpart.

(Sec. 3, 68 Stat. 675; 50 U.S.C. 198)

§ 67.90-25 Certificate of inspection.

A vessel may be documented under the provisions of this subpart although no certificate of inspection has been issued or filed with the Officer in Charge.

(Sec. 3, 68 Stat. 675; 50 U.S.C. 198)

§ 67.90-27 Citizenship; master and watch officers.

The master and watch officers of a vessel documented under the provisions of this subpart shall be citizens of the United States, except in those cases where that requirement of law is waived as provided for in section 3(b) of the Act of August 9, 1954.

(Sec. 3, 68 Stat. 675; 50 U.S.C. 198)

§ 67.90-29 Home port; change of.

If the Secretary of Commerce desires to change the home port of a vessel documented under the Act of August 9, 1954, application shall be made for the approval of the new home port in the manner prescribed in § 67.90-17.

(Sec. 3, 68 Stat. 675; 50 U.S.C. 198)

§ 67.90-31 Master's oath for enrollment and license.

(a) No master's oath is required for the issuance of a register under the Act of August 9, 1954.

(b) Prior to the granting or renewing of the enrollment and license or license of any vessel under the Act of August 9, 1954, the master shall swear that such license shall not be used for any other vessel or for any other employment than the coasting trade, or in any manner whereby the revenue of the United States may be defrauded.

(c) This oath may be taken before any officer authorized by law to administer oaths generally and may be mailed to the Officer in Charge together with the enrollment and license or license, whereupon action shall be taken as if the oath had been administered by the Officer in Charge.

(Sec. 3, 68 Stat. 675; 50 U.S.C. 198)

§ 67.90-33 Change of master.

When the master of any vessel documented under the Act of August 9, 1954, is changed, the new master shall report the change to the Officer in Charge at the port where the change takes place or where the vessel shall first arrive after the change, and shall produce to the Officer in Charge, the vessel's marine document and make oath that he is the new master of the vessel. The Officer in Charge shall then endorse upon the document the name of the new master.

(Sec. 3, 68 Stat. 675; 50 U.S.C. 198)

§ 67.90-35 Issue, record, and surrender of documents.

(a) The provisions of §§ 67.25-1 and 67.25-3 and Subpart 67.33 shall apply with respect to marine documents issued under the Act of August 9, 1954.

(b) No enrollment and license or license shall be issued for a longer period than is authorized by the permit referred to in § 67.90-19.

(Sec. 3, 68 Stat. 675; 50 U.S.C. 198)

§ 67.90-37 Renewal of marine document.

A marine document granted to any vessel under the Act of August 9, 1954, shall be presented to the Officer in Charge of the port at which the vessel may be at the time of its expiration within 3 days after that time, or if the vessel be at sea at that time, within 3 days after her first arrival at a port of the United States. Such a marine document may be renewed by the Officer in Charge upon the request of the master or the Secretary of Commerce if at the time of such request the documentation of the vessel is not prohibited by the Act of August 9, 1954, by any order of the Commandant issued under authority of that Act requiring surrender of the vessel's marine document, or by any provision of the regulations in this Part.

(Sec. 3, 68 Stat. 675; 50 U.S.C. 198)

§ 67.90-39 Exchange of marine document.

(a) Any vessel enrolled and licensed or licensed under the Act of August 9, 1954, may be registered.

(b) Any vessel registered under the Act of August 9, 1954, may be enrolled and licensed or licensed for the coasting trade if a permit in duplicate issued by the Secretary of Commerce under section 3(c) of the Act of August 9, 1954, authorizing a vessel to engage in the coastwise trade is filed with the Officer in Charge.

(Sec. 3, 68 Stat. 675; 50 U.S.C. 198)

APPENDIX

NOTE: The substance of Forms CG-1260, CG-1262, and CG-1263 prescribed in Subparts 67.21, 67.03, and 67.23 is reproduced below. Typewritten or other reproduced copies may be used.

CG-1260

DEPARTMENT OF TRANSPORTATION

U.S. COAST GUARD

OATH ON LICENSE OR ENROLLMENT AND LICENSE, FOR OPERATION OF UNDOCUMENTED VESSEL, OR FOR QUALIFICATION OF CORPORATION AS A CITIZEN OF THE UNITED STATES UNDER THE ACT OF SEPTEMBER 2, 1958 (46 U.S.C. 883-1)

Vessel:[1]
Rig ——————————————
(Scow, barge, oil screw, etc.)
Name ——————————————
Official No.[2] ——————————————
Home Port[2] ——————————————
Year of build ——————————————
Place of build ——————————————
Service ——————————————
(Freight, towing, etc.)
Gross[2] ——————————————
Net[2] ——————————————
Length ——————————————
Horsepower ——————————————
Corporation:
Name ——————————————
Address[3] ——————————————
State where incorporated ——————————————
Affiant:
Name ——————————————
Address ——————————————
Company ——————————————
Title or capacity[4] ——————————————

I, the affiant named above, swear that the information which I have given, including that respecting the vessel and the corporation, is, to the best of my knowledge and belief, true, complete, and correct; that the corporation named is the sole owner of the vessel named and described above;

That no subject or citizen of any foreign prince or state, is directly or indirectly, by way of trust, confidence, or otherwise, interested in the vessel, or in the profits or issues thereof;[5]

That a majority of the officers and directors of such corporation are citizens of the United States, as shown by the attached listing incorporated in and made a part of this oath which truly and correctly names all such officers and directors, giving the home address and citizenship of each; that not less than 90 percent of the employees of such corporation are residents of the United States; that such corporation is engaged primarily in a manufacturing or mineral industry in the United States or in a Territory, District, or possession thereof; that the aggregate book value of the vessels owned by such corporation does not exceed 10 percent of the aggregate book value of the assets of such corporation; that such corporation purchases or produces in the United States, its Territories, or possessions not less than 75 percent, of the raw materials used or sold in its operation;[6]

That all equipments or any part thereof, including boats, purchased for, or the repair parts or materials to be used, or the expenses of repairs made in any foreign country upon said vessel within the year immediately preceding the date of this application, have been duly reported and accounted for under the provisions of sections 257 and 258, title 19, and section 272, title 46, United

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[1] The portion of the form requiring vessel identification shall be struck out when the affiant's oath is filed merely to qualify as a citizen under the Act and not as an owner and operator.

[2] Do not complete this blank in the case of an undocumented vessel.

[3] Show address where vessel business of owner or operator is conducted; when corporation is qualifying under Act other than as owner or operator of vessel, show place of principal business.

[4] Show the capacity in which the affiant is acting for the owning corporation, as "President," "Secretary," "Specially authorized officer," or "Agent" as the case may be.

[5] "Interest" as used herein does not refer to the ownership of stock of the corporation owning the vessel or to control of the corporation by way of voting or other direct or indirect means but rather refers to ownership of the vessel itself. Strike out this clause in the case of a licensed vessel of less than 20 net tons.

[6] Attach the required list of the names of all officers and directors of the corporation, giving the home address and citizenship of each.

States Code, and the duties thereon have been duly paid.

[7] ——————————

——————————

Subscribed and sworn to before me on the day and year shown.

——————————————————

(Notary Public or Officer in Charge, Marine Inspection)

Date —————

* * * * *

MASTER'S OATH ON REGISTRY, LICENSE, OR ENROLLMENT AND LICENSE

I, ——————————————————

——————————————————

(Street and No., city and State)

master of the ——————————,

(Rig) (Name of vessel),

Official No. ——— swear that I am a citizen of the United States, having been born in ———, ————————, on ———,[8]

(City) (State or county)

———, and naturalized before the[8]———

——————— for ———————

(Name of Court) (District, county, or State)

on —————,[8]———, having been issued Naturalization Certificate No. ———; and I also swear that the license granted to the said vessel shall not be used for any other vessel or for any other employment than the coasting trade or in any trade or business whereby the revenue of the United States may be defrauded.

——————————

(Master)

Subscribed and sworn to before me this ——— day of ———, 19—.

——————————

(Officer in Charge, Marine Inspection)

CG-1262

DEPARTMENT OF TRANSPORTATION

U.S. COAST GUARD

CERTIFICATE OF COMPLIANCE WITH THE PROVISIONS OF THE ACT OF SEPTEMBER 2, 1958 (46 U.S.C. 883-1)

Port of place —————
Date —————
Name of vessel ————— Rig —————
Name of corporation —————
Address —————
State of incorporation —————

The corporation named and identified above has on this date complied with the provisions of 46 CFR Subpart 67.23, by filing the corporate certificate under oath required under the Act of September 2, 1958 (46 U.S.C. 883-1), and is hereby authorized to operate the undocumented vessel named herein, if any, in the coastwise trade subject to the limitations of the Act. This certificate and any authorization granted hereunder expire 3 years from the date shown above unless there first occurs a change in corporate status requiring a report under Subpart 67.23 cited above.

(Signature) ——————————
(Title) ——————————

* * * * *

CG-1263

DEPARTMENT OF TRANSPORTATION

U.S. COAST GUARD

OATH OF PARENT OR SUBSIDIARY CORPORATION ACT OF SEPTEMBER 2, 1958 (46 U.S.C. 883-1)

Port —————
Date —————
Individual affiant's name —————
Address —————
Capacity of title —————

——————————————————

Corporate name (parent)[9] (subsidiary) ———

——————————————————

Address —————
State of incorporation of parent or subsidiary —————

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[7] The officer or agent of the corporation subscribing to this oath, if other than the president or secretary, shall present a written instrument attested by the corporate seal, authorizing him to act in this behalf.

[8] Strike out portion relating to naturalization if native-born citizen.

[9] The term "parent corporation" for the purposes of this oath means a corporation incorporated under the laws of the United States, or any State, Territory, District, or possession thereof, which controls, directly or indirectly, at least 50 percent of the voting stock of a corporation which is a citizen of the United States as defined in 46 CFR 67.03-7(a) and the Act of September 2, 1958 (46 U.S.C. 883-1). Strike out the inapplicable term.

Name of associated corporation ——————
Address ——————————————
State of incorporation of associated corporation ——————————————

I, the affiant named above, swear that the corporation first named herein is the (parent)[9] (subsidiary)[10] of the associated corporation named; that I am the duly authorized officer or agent of such corporation; that the associated corporation named has previously established that it is a citizen of the United States within the meaning of the Act of September 2, 1958 (46 U.S.C. 883-1), having filed a certificate under oath to that effect with the Officer in Charge concerned; that a majority of the officers and directors of the said parent or subsidiary corporation are citizens of the United States, as shown by the attached listing incorporated in and made a part of this oath which truly and correctly names all such officers and directors, giving the home address and citizenship of each; that not less than 90 percent of the employees of such parent or subsidiary corporation are residents of the United States; that such parent or subsidiary corporation is engaged primarily in a manufacturing or mineral industry in the United States or in a Territory, District, or possession thereof; that the aggregate book value of the vessels owned by such parent or subsidiary corporation does not exceed 10 percent of the aggregate book value of the assets of such corporation; and that such parent or subsidiary corporation purchases or produces in the United States, its Territories, or possessions not less than 75 percent of the raw materials used or sold in its operations.

Signed ——————————————

Subscribed and sworn to before me on the day and year shown.

——————————————
(Notary Public or Officer in Charge, Marine Inspection)
(Date) ——————

PART 68—[RESERVED]

PART 69—MEASUREMENT OF VESSELS

Subpart 69.01—General Provisions

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[10] The term "subsidiary corporation" for the purposes of this oath means a corporation incorporated under the laws of the United States, or any State, Territory, District, or possession thereof, not less than 50 percent of the voting stock of which is controlled, directly or indirectly, by a corporation which is a citizen of the United States as defined in § 67.03-7(a) (46 CFR 67.03-7(a)), and the act of Sept. 2, 1958 (46 U.S.C. 883-1) or by a parent corporation of any such corporation. Strike out the inapplicable term.

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AUTHORITY: Secs. 2, 3, 23, Stat. 118, as amended, 119, as amended, R.S. 4148, as amended, 4150, as amended, 4153, as amended, sec. 12, 79 Stat. 893, sec. 6(b)(1), 80 Stat. 937; 46 U.S.C. 2, 3, 71, 74, 83h, 49 U.S.C. 1655(b)(1); 49 CFR 1.46(b) (35 FR 4959).

SOURCE: CGFR 69-138, 34 FR 20131, Dec. 23, 1969, unless otherwise noted.

Subpart 69.01—General Provisions

NOMENCLATURE CHANGE: 45 FR 64586, Sept. 30, 1980.

§ 69.01-1 Referral to Commandant in cases of doubt.

Doubts arising in the minds of the admeasurers concerning decks to the hull, enclosures on or above the upper deck, shelter decks, method of procedure, etc., shall be submitted to the Commandant for his decision, and shall be accompanied by blueprints or sketches of the spaces in question giving all the facts bearing on same.

§ 69.01-3 What vessels are to be admeasured.

(a) Before any vessel is registered, enrolled and licensed, or licensed, or issued a certificate of record, her tonnages shall be ascertained by an officer of the Coast Guard as provided in this part.

(b) In the discretion of the Commandant, a vessel not required by law to be admeasured may nevertheless be admeasured upon his own motion or upon application by the owner, a Federal or State agency, or a foreign government.

§ 69.01-5 Purpose for which measurements are taken.

(a) Tonnage measurements are taken for the purpose of ascertaining the internal capacity of measurable spaces.

(b) All measurements are to be taken in feet and fractions of feet, and all fractions of feet shall be expressed in decimals.

§ 69.01-7 Suez Canal certificates.

Suez Canal special tonnage certificates will be issued, upon application, by an Officer in Charge to American shipowners, requiring them for ships which will use the said canals. An Officer in Charge will also issue such tonnage certificates to public vessels of the United States requiring them.

§ 69.01-9 Register ton.

A register ton is a volume of 100 cubic feet.

§ 69.01-11 Gross register tonnage.

(a) The gross tonnage, referred to in this part is the gross register tonnage; that is, the gross tonnage exclusive of all permissible exempted spaces. Under the provisions of § 69.15-17(b), a vessel may have two gross tonnages. The higher gross tonnage is applicable when a tonnage mark which is placed and displayed on the side of the vessel is submerged and the lower is applicable when the tonnage mark is not submerged.

(b) Except in the case of a vessel which is measured under the provisions of Subpart 69.15, or under the provisions of Subpart 69.17, the gross register tonnage of a vessel shall consist of the following items:

(1) The cubic capacity below the tonnage deck, excluding exemptible water-ballast spaces within the measurable portion of the vessel;

(2) The cubic capacity of each between-deck space above the tonnage deck;

(3) The cubic capacity of the permanent closed-in spaces on the upper deck available for cargo or stores, or for the accommodation of passengers and/or crew;

(4) All permanent closed-in spaces situated elsewhere available for cargo or stores, or for the accommodation of the crew, or for the charts, except cabins or staterooms for passengers, constructed entirely above the first deck which is not a deck to the hull;

(5) The excess of hatchways.

(c) The gross tonnage of a vessel measured under the provisions of Subpart 69.15 shall be determined as provided by § 69.15-15(a).

(d) The gross tonnage of a vessel measured under the provisions of Subpart 69.17 shall be determined as provided by § 69.17-5.

§ 69.01-13 Net register tonnage.

(a) The tonnage of a vessel remaining after the authorized deductions have been made from the gross register tonnage shall be deemed the net register tonnage. Under the provisions of § 69.15-17(b) a vessel may have two net tonnages. The higher net tonnage is applicable when a tonnage mark which is placed and displayed on the side of the vessel is submerged and the lower is applicable when the tonnage mark is not submerged.

(b) In ascertaining the net tonnage, no space may be deducted unless it has previously been included in the gross tonnage.

(c) The net tonnage of a vessel measured under the provisions of Subpart 69.17 shall be determined as provided by § 69.17-7.

§ 69.01-15 The marine document.

(a) The marine document of every vessel except one admeasured under the provisions of Subpart 69.17 shall show the date and place of build, the register length, breadth, depth, and the height of the upper deck to the hull above the tonnage deck; if applicable, the depth (D_t) and the length (L_t)used with the tonnage mark table and the distances to the tonnage mark from the line of the upper deck and from the molded line or equivalent of the second deck; the number of decks and masts; build as to her stem and stern; capacity under the tonnage deck, that of the between decks, and also separately, permanently enclosed spaces on or above the upper deck to the hull required to be included in the gross tonnage, and the omitted spaces, whether open or closed-in, on, above, or below the upper deck; the gross tonnage or tonnages; items of deduction; and the net tonnage or tonnages.

(b) The marine document of every vessel admeasured under the provisions of Subpart 69.17 shall show the date and place of build, the register length, breadth, and depth, and the gross and net tonnages.

§ 69.01-17 Application for measurement.

The builder of a new vessel which is to be admeasured, the person having supervision of changes or alterations, or both, affecting a vessel's register tonnage, and the owner of a vessel who elects to have her admeasured under the provisions of Subpart 69.17 or who, having had the vessel so admeasured, elects or is required to have her admeasured under the appropriate provisions of §§ 69.03-1 through 69.15-41, shall apply in writing for admeasurement or tonnage adjustment, as the case may be, to the Officer in Charge of the marine inspection zone where the vessel is located. Except in the case of admeasurement under Subpart 69.17, application should be made in time to permit admeasurement before cargo or ballast is taken on, and in case of a new vessel, before boilers or engines are installed or compartments partitioned off. The application shall state the name and the official number of the vessel, if any, the name, address, and telephone number of the owner, the exact location of the vessel, the date and place of build and the builder's name, the rig, and model or other identifying numbers.

§ 69.01-19 Drawings.

(a) *Plans to be filed.* In order to facilitate admeasurement, there shall be furnished by the vessel's builder or owner to the Officer in Charge of the marine inspection zone in which the vessel will be admeasured, either with the application for admeasurement or a reasonable period before admeasurement is scheduled to commence, blueprints or drawings of the following:

(1) A drawing of the cross section in which is shown the construction of the double bottom, if there be one;

(2) An inboard view of the longitudinal section, showing the double bottom, its use or uses, if existing, otherwise the floors, the compartments for water ballast, other than the double bottom, the decks, the superstructures, hatchways, etc.;

(3) Deck plans showing the arrangement and uses of different compartments and deductible spaces;

(4) Drawings showing the arrangement of the engine, boiler, and fuel compartments; and

(5) A tonnage plan showing half breadths of the sections at the points of division of the tonnage length of the vessel into a certain number of equal parts in accordance with the rules for the measurement of spaces under the tonnage deck. The scale or scales of these drawings are to be indicated thereon.

The Officer in Charge is to be advised of any subsequent changes in the vessel and furnished copies of the corrected plans, or a statement of such changes. If there are no blueprints or drawings available and if the Officer in Charge is satisfied that it is impracticable to require such plans to be prepared and made available, considering the size and nature of the vessel as well as the cost and time involved, the vessel shall be measured without requiring their production.

(b) *Sketches.* When blueprints or drawings are not produced, necessary rough sketches may be made during the course of admeasurement showing the inboard profile, the midship cross-section, the hull and deck arrangements, and related matters, recording any necessary dimensions and showing details of important features such as the depth of side and bottom frames or floor timbers; the dimensions, location, and use of structures and hull spaces; and the thickenss of the inner and outer skin. Such rough sketches shall be retained and filed with the other admeasurement papers. The rough sketches made shall not be redrawn to scale unless the admeasurer is satisfied that such action is necessary to insure that accurate dimensions have been lifted, to avoid the necessity for readmeasurement, or to insure against a claim of error which may reasonably be expected to be made in a particular case by the owner or agent.

§ 69.01-21 Measurements to be taken at an early stage.

Admeasurement should begin as soon as the vessel is sufficiently advanced in construction to permit its being done, usually when the decks are laid, the hold cleared of encumbrances to admit the required depths and breadths being properly taken; before the engine and boilers are installed and accommodations are partitioned off.

Subpart 69.03—Standard System of Measurement

§ 69.03-1 Uniform system required.

(a) The following directions are given, showing the progressive steps to be followed in the process of admeasurement. It is important not only that the rules be followed, but that required measurements be taken and calculations made in a uniform and correct manner that one general system may prevail throughout the service respecting this subject.

(b) Measurements taken aboard are to be recorded in the "Memorandum of Dimensions" known as Form CG-1413.

(c) These directions do not apply to admeasurement under the provisions of Subpart 69.17.

§ 69.03-3 Measuring instruments.

(a) The measurements should be made with a waterproof tape, graduated into feet and tenths of a foot, and as nearly inelastic as possible.

(b) Sliding rods which are of three sizes: One 3 feet long for taking depths from 3 to 5.8 feet; another 6 feet long for taking depths from 6 to 11 feet, or, with the extension piece attached, to 16 feet; and a third one 11 feet long for taking depths from 11 to 21 feet, or, with the extension piece attached, to 26 feet. The movable or index rod in each has an arrow index traversing a decimal scale on the fixed rod. Greater depths may be taken by inserting into the ends of the index rods, an extension piece, provided with sockets for this purpose one or more joints of lift rods described below:

The fixed rod is graduated in feet (in red) and tenths and half-tenths (in black), and when the ends of the rods are well together the arrow on the index rod points to the figure indicating the constant length of the fixed rod, and as the index rod is moved up the arrow indicates the length from the upper end thereof to the lower end of the fixed rod. Bear in mind, however, that when you use any of the attachments referred to above you must add to the reading on the fixed rod the net length of the attachment used; e.g., if the 6-foot rod is extended to its limit, 11 feet, which is reached when the arrow on the index rod is fair with the upper end of the fixed rod, and the extension piece is attached, which is done by slipping the bands on the lower end of it over the upper end of the index rod until the upper edge of the upper band is fair with the upper end of the index rod, and by fastening (on the groove side of the index rod) with set screws in the said bands, the length will not be 11 feet, as shown by the reading, but 16 feet, the reading plus the increment due to the attachment (11 feet + 5 feet). This increment may be further increased by inserting into the end of the extension piece one or more joints of lift rods, each of which is about 3.95 feet when adjusted.

At the station of the area to be measured in single-deck vessels the rod is to be placed on the ceiling, or floor beam or timber when no ceiling is present, alongside the keelson or line of the keel, perpendicular or square thereto, and also parallel to the middle longitudinal plane of the ship, and forced up firmly under the deck and fixed in such position by the set screws; from the depths thus found take one-third of the round or one-half of the pitch of beam to get the depth of the area.

The depth of an area taken as above is to be divided into the required number of equal parts. (See § 69.03-35(d).) With the rod fixed in position as above, set off on it from its lower end one of these equal parts, or common interval between the breadths, using white or other colored chalk or material that will make a visible mark, which gives the position of the first breadth above the bottom breadth, and from this when the rod is taken down the positions of the remaining breadths are to be set off at the said common interval.

The positions of all the breadths being thus severally marked on the rod, it is then to be set up again and firmly fixed or held in position, and the breadths may be readily and correctly measured by means of the tape held at right angles across the rod at each of the positions marked thereon.

In measuring vessels with more than one deck, where the second deck from the bottom is the tonnage deck, it will be necessary to use two of these rods in combination, one directly over the other, one in the hold under the first deck, as directed for single-deck vessels, and the other in the space between this deck and the tonnage deck. In this combination the tonnage depth is found by adding together the two depths and the thickness of the deck between the rods and deducting from this combined depth one-third of the round or one-half pitch of beam; then proceed as before directed.

(c) A 2-foot rule with a hinge is required for taking the rake of the bow and stern and for other purposes.

(d) A carpenter's square will be found useful for setting the sliding rod perpendicular to the keelson.

(e) For taking the breadths in the hold which are beyond the reach of the measuring officers two lift rods will be needed, each about 8 feet long (made by joining two sections), one having a pulley at the end over which the tape may be drawn when the rods are held in position and the other an attachment for holding the ring at the end of the tape.

(f) For transferring the location of the stations or ordinates of the transverse sections from the deck to the keelson, and sometimes, for finding registered breadth, a plumb line and bob are needed.

(g) For measuring laden vessels for Panama or Suez Canal tonnage certificates, a girting galvanized chain of an approved make is required.

§ 69.03-5 Stem.

A vessel's stem is to be described according to its contour; i.e., straight, raked, curved or square.

§ 69.03-7 Stern.

Describe the stern according to its shape at the after end below the upper deck or line of same, as round, elliptical, square or sharp.

§ 69.03-9 Masts.

In addition to what are commonly known as masts, spars set up at the center line of the bridging at the top of king-posts of certain vessels for signals and wireless antennae, etc., are to be considered as masts. The number of king-posts and derrick posts, etc., independent of the supported masts are to be separately stated after the number of said masts; e.g., "Two masts and eight king-posts," or as the case may be.

§ 69.03-11 Ceiling, cargo battens, etc.

(a) *Ceiling.* Ceiling hereafter referred to is considered the permanent planking fitted directly on the inboard side of the frames, or floors, or the top of the double bottom. The maximum allowance for ceiling is 3 inches on the bottom and 3 inches on each side. When ceiling is found to be less than 3 inches thick, allow the actual thickness thereof; that is, take dimensions to the face of the ceiling so found. Depths and breadths shall not be decreased due to grounds supporting ceiling nor shall allowance be made for ceiling on the under side of deck beams.

(b) *False ceiling.* In small vessels with "false ceiling" in a portion of their cabins, in their holds, or forming a part of their seats or lockers, etc., therein, and which stands off from their frames—that is, not fitted to them as ordinary ceiling—take the breadths through the said "false ceiling" to the inner faces of the vessel's frames, deducting therefrom the thickness of the "false ceiling" on each side. If, however, there is a ceiling fitted on the frames in addition to the "false ceiling," take the breadths to the ceiling on the frames, making no allowance for the "false ceiling."

(c) *Cargo battens, insulation.* Paragraph (a) of this section applies to cargo battens (spar ceiling) and refrigeration insulation.

§ 69.03-13 Register length.

(a) The length measured on the tonnage deck, from the fore part of the outer planking (where it is rabbeted) on the side of the stem of wooden vessels, or fore end of lap of outer plating of steel or iron vessels, to the after side of the main sternpost, shall be accounted the vessel's register length. (See Figures 2 and 3 (§ 69.07-1).)

(b) In the case of screw vessels with no sternpost, take the length to the forward side of the rudder-stock or line of same extended through the deck.

(c) The register length of scows and barges, with a square bow and stern sloping up from the bottom to the deck, and with neither stem nor sternpost, is to be taken on the deck from the extreme point of the hull at the bow to the extreme point of the hull at the stern; that is, the overall length of the hull, not including guards or rubbing strakes, is to be considered the register length of such vessel.

§ 69.03-15 Register breadth.

(a) A measure from the outboard face of the outer skin on one side to the same point opposite, taken at or below the upper deck and at the widest part of the hull is the register breadth. (See Figure 4 (§ 69.07-1).)

(b) A practical method for finding the register breadth is, to add twice the sum of the depth of the vessel's side frames and thickness of outer skin, plus an allowance for thickness of ceiling, insulation or cargo battens if fitted, to the greatest tonnage breadth.

§ 69.03-17 Register depth.

(a) The register depth is taken at the middle of the tonnage length from the under side of the tonnage deck, or line of same, down to the top of the floors at the side of the keelson; or to the ordinary floor timbers or plates when fitted; or to the inner bottom plating (tank top) of a cellular double bottom; as the case may be, in a direction perpendicular to the keel.

(b) Should ceiling be fitted on the above mentioned bottom members, the register depth shall be measured to the top of same and to this dimension shall be added the height of grounds, battens or other type of support for the ceiling. (See Figures 4 and 5 (§ 69.07-1).)

(c) If the vessel is measured in parts, as explained later, the register depth is taken at one-half the tonnage length of the vessel.

§ 69.03-19 Upper deck to the hull.

The uppermost complete deck, which extends from stem to stern and from side to side at all points of its length and below which there are no openings through the hull as required in shelter deck spaces and also having its hatchways or other openings provided with means for closing them against the action of the sea and weather upon the space below enclosed by the sides of the vessel, making the said space a fit place for the stowage of general cargo, is to be considered the upper deck to the hull.

§ 69.03-21 Enumerating the decks.

In enumerating the number of decks, only those which are without such openings as exempt the spaces beneath from being included in the tonnage under the upper deck are to be considered. Other decks, if any, containing such openings as exempt the spaces beneath from inclusion in tonnage should be separately described after the number of decks proper; e.g., "Two decks and shelter deck," or as the case may be. Partial decks, forward or aft, such as orlop decks, are not considered as decks.

§ 69.03-23 Register height.

The height from the top of the tonnage deck planking and/or plating to the underside of the planking and/or plating of the upper deck to the hull shall be deemed the register height of the upper deck to the hull above the tonnage deck.

§ 69.03-25 Round of beam.

(a) The round of beam (camber) is the perpendicular distance down from the crown of the under side of the tonnage-deck plank or plating at the center to a line stretched athwart the vessel from end to end of the top of the beam and is to be ascertained at every place where it is to be used in the measurement. (See Figures 6 and 16 (§ 69.07-1).)

(b) The round of beam of the tonnage deck, which must be known before taking the tonnage length, as well as before measuring the depths of the tonnage sections, may be taken either at the under side of the deck by stretching a small line tightly from end to end at the top of the beam, which will show the round or camber of the beam at the center; or it may be taken, if more convenient, at the upper side of the deck by stretching a line tightly across, held at equal heights from the deck at each side of the vessel, so as just to touch the crown of the deck at the middle line; then the distance from the deck to the line at the vessel's sides gives the round of beam. (See Figure 6 (§ 69.07-1).) It is necessary to take the round of beam at each point of division of the length except when the vessel has a flat deck or one practically so. In lieu of the above methods, it may be ascertained on the basis of one-fourth of an inch to the foot of beam at each section in iron or steel vessels of the usual camber of beam. This method is more accurate and easier of application than the others.

(c) When the round of beam is 0.15 foot or less, it may be ignored.

§ 69.03-27 Pitch of beam.

(a) In vessels whose tonnage deck has a pitch instead of a round from its side at the shell plating to its center, find the height of the pitch of the beam at each tonnage section. It may be done in any practical manner.

(b) The height of the pitch of the beam is the perpendicular distance from the apex at the under side of the tonnage deck plank or plating at the center of the deck down to a straight line from end to end of the top of the beam. (See Figure 7 (§ 69.07-1).)

§ 69.03-29 Tonnage deck.

(a) Except as to a vessel having its tonnage deck determined under the provisions of § 69.15-1(d) the tonnage deck is the upper deck to the hull in vessels having not more than two decks, and the second from the keel in vessels having more than two decks.

(b) If the tonnage deck consists of several partial decks extending with breaks from stem to stern, and if the partial decks are at different heights, the line of the lowest deck will be taken as the tonnage deck, and the headroom above such line under the higher deck or decks will be measured as a break.

(c) Engine and boiler casings, peak tanks and cofferdams are not considered as breaking the continuity of a deck. (See Figures 8 and 9 (§ 69.07-1).)

§ 69.03-31 Tonnage length.

The tonnage length is the longitudinal distance on the under side of the tonnage deck, or line of same from a point where the line of the inboard faces of the side frames, or ceiling thereon if any, intersects the side of the stem, to a point aft on the inboard face of the stern timber or cant frame, or ceiling if fitted thereon. (See Figures 10 and 11 (§ 69.07-1).)

§ 69.03-33 Depth of a transverse section.

(a) *Depth.* The depth of a tonnage section is a measurement taken at its proper point of division of the tonnage length, from a point at a distance below the tonnage deck equal to one-third of the round or one-half of the pitch of the beam, down to the upper side of the floor timbers or floor plates; or bottom floors alongside the keelson; or longitudinals; or the tank top of a cellular double bottom, as the case may be.

(b) *Ceiling.* If ceiling is fitted on the bottom floor members, depths of transverse sections terminate on the upper face of the ceiling of average thickness. (See Figure 4 (§ 69.07-1).) For tonnage depths where ceiling is fitted on tank top, see Figure 5 (§ 69.07-1).

(c) *Raised platform.* In vessels with a raised platform in the bottom and no ceiling fitted on the bottom frame members, the depths are to be taken down through the platform to the upper side of the floor timbers or floor plates as described above, deducting therefrom the thickness of the ceiling of the platform in question.

(d) *Depths in way of interruptions to tonnage deck.* Should depths of transverse sections fall where the tonnage deck is interrupted, due to a break, hatches, etc., then depths are taken from the line of continuation of the tonnage deck.

(e) *Rise of double bottom.* In vessels having a double bottom the tank top of which, in way of tonnage sections, rises from the center line to the wings, the tonnage depth of each section will terminate at one-half height of the dead rise. (See Figure 12 (§ 69.07-1).)

(f) *Fall of double bottom.* In vessels having a double bottom the tank top of which, in way of tonnage sections, has a straight fall from the center line to the wings the tonnage depth of each section will terminate at one-half height of fall. (See Figure 13 (§ 69.07-1).)

§ 69.03-35 Tonnage depths.

(a) *The tonnage depth.* The depth generally referred to as "the tonnage depth" is located at the middle point of division of the tonnage length and is found in a manner similar to the other depths of transverse sections.

(b) *Tonnage depth in a vessel measured in parts.* Should a vessel be required to be measured in parts, and each part measured as a separate unit; then a tonnage depth shall be found for each part or unit at one-half its tonnage length. (See Figure 14 (§ 69.07-1).)

(c) *Tonnage depth is the first depth measured.* The tonnage depth governs the number of parts into which it and all the remaining depths of the part in which said depth is located, is divided.

(d) *Divisions of tonnage depth.* If the tonnage depth at the middle of the tonnage length of the vessel or part of same does not exceed 16 feet, divide each depth into four equal parts; but if the depth at the middle of said length exceeds 16 feet, divide each depth into six equal parts.

(e) *Intervals.* The common intervals between the points of division of depths, also one-third common intervals, are to be carried to the nearest hundreth of a foot.

(f) *Purpose for dividing tonnage depths.* Depths are divided to indicate points at which tonnage breadths are to be measured.

§ 69.03-37 Tonnage breadths.

(a) *Breadths.* An inside horizontal breadth is to be measured at each point of division of the depth marked on the sliding rods placed in position as directed in § 69.03-3(b) and also at the upper and lower points of the depth. Extend each measurement to the inboard face of the ordinary frames, or line of same, or inboard face of ceiling, or battens, or insulation of average thickness if fitted. (See Figure 15 (§ 69.07-1).) Care must be taken that the sections shall be parallel to each other and at right angles to the axis of the vessel.

(b) *Upper breadth.* (1) In finding the upper breadth of each transverse section make no allowance for the excess of the deck-beam shelves, etc., over the permissible thickness of ceiling, if any, thereunder.

(2) Referring to Figure 16 (§ 69.07-1), observe that after the deck is laid the upper breadth (represented by the line U B) passes through the deck on each side. Hence, it is impossible to take it at its true position. In such cases take it on the deck, allowing within the extended line of frames the thickness of the ceiling if any on the frames under deck, as shown by line T B in the figure.

(3) Owing to deck-beam shelves or other obstructions, it can be more conveniently and accurately taken here than under the deck, and besides it will be only a few inches from its true position. In vessels which have upright sides the said breadth so taken will be correct, but in the case of vessels with inclining sides the necessary allowance must be made for the deviation of the sides from the upright in the few inches above the true position of the said breadth.

(c) *Bottom breadths.* (1) Bottom breadths are taken only so far as the flat of the floor extends. (See B B, Figures 4 and 5; Figure 15; and B B, Figures 17 and 18 (§ 69.07-1).)

(2) When bottom frames rise immediately from the keelson, or combined keel and keelson, and bona fide floor timbers or floor plates are not fitted, bottom breadths are equal to the breadth of keelson, or combined keel and keelson as the case may be. (See B B, Figure 19 (§ 69.07-1).)

(3) The bottom breadths of transverse sections of vessels of longitudinal construction falling in the hold where there is no double bottom and where there is a dead rise of the bottom out to the sides of the vessel may be considered to be equal to that part of the bottom plating not affected by dead rise.

(d) *Bottom breadths in case of rise or fall of double bottom.* Bottom breadths falling in way of a double bottom the top of which rises or falls from the midship longitudinal plane to the wings are measured from and to the inboard end of the frame brackets (or ceiling thereon if fitted), connecting the double bottom with the frames.

(See B B, Figures 12 and 13 (§ 69.07-1).)

§ 69.03-39 Measuring the tonnage length.

(a) The cubic capacity of the space below the tonnage deck is determined by use of the tonnage length together with the areas of a prescribed number of transverse sections as hereinafter described.

(b) To determine the extreme points of the tonnage length as indicated by § 69.03-31 and T L in Figures 10 and 11 (§ 69.07-1), observe the following:

(1) *Vertical bow and stern.* In vessels having a vertical bow, also a vertical stern, both above and below the tonnage deck, measure horizontally the depth of frames, also the thickness of ceiling thereon if any, at the extreme forward and after ends immediately under the tonnage deck. Mark these measurements on the upper side of the tonnage deck, from the outer shell and in the direction in which the frames were measured. Then draw through the points thus obtained, lines parallel to the shell. The forward and after points of intersection of these lines indicate the points from and to which the tonnage length is to be measured.

(2) *Raked bow or stern.* In the case of vessels having a raked bow or stern at the level of the tonnage deck, the extreme points of the tonnage length are, when practicable, to be determined at the under side of the tonnage deck. The distance from these points to a hatch coaming, bulkhead, etc., should be measured and transferred to the upper side of the tonnage deck as indicated in Figure 20 (§ 69.07-1).

(c) Should it be impracticable to determine the extreme points of the tonnage length at the under side of the tonnage deck, and should the thickness of this deck be considerable, as in the case of a wooden deck, the rake of the bow or stern within the thickness of the deck is to be taken into account. This is done after having first proceeded as indicated in paragraph (b)(1) of this section by measuring the thickness of the tonnage deck and determining by means of a hinged rule, or any other instrument for finding angles under similar circumstances, the angle of the rake which the bow or the stern forms with the tonnage deck. Transfer thereafter this angle on the deck by drawing the lines A B C shown in Figure 21 (§ 69.07-1), A B represents the upper side of the tonnage deck and B C the after side of the stem or the inside of the shell at the stern, as the case may be. The perpendicular B D represents the thickness of the tonnage deck. The points T, L, in Figures 10 and 11 (§ 69.07-1) marked on the upper side of the tonnage deck are then to be moved forward at the stern or aft at the stem, as the case may be, for a distance equal to D E, representing the rake within the thickness of the deck.

(d) It should be borne in mind that the condition for applying the method of setting out the angles on the upper side of the tonnage deck is that the stem or stern have the same angle of rake above and immediately below the tonnage deck. If the angle of rake at or immediately below the tonnage deck is a different one, then this last angle must be used.

(e) Should a vessel as referred to in paragraph (b)(2) of this section have a square bow or stern, it will be necessary to make a correction for camber where such exists. This is done by increasing the thickness of the deck B D in Figure 21 (§ 69.07-1) by one-third of the round or one-half of the pitch of beam at the extreme point of the tonnage length.

§ 69.03-41 Divisions of tonnage length.

(a) The tonnage length is to be divided into an even number of equal parts as required by the following table, according to the class in such table to which the vessel belongs:

Class	Tonnage length	Divisions
1	50 ft. or less	6
2	Above 50 ft., not exceeding 100 ft.	8
3	Above 100 ft., not exceeding 150 ft.	10
4	Above 150 ft., not exceeding 200 ft.	12
5	Above 200 ft., not exceeding 250 ft.	14
6	Above 250 ft.	16

(b) The points of division of the tonnage length, also each end of the length indicate the common intervals at which a depth is measured. Intervals and one-third intervals are to be carried to the nearest thousandth of a foot.

§ 69.03-43 Transfer of location of sections to keelson.

(a) The tonnage length having been ascertained and the number of sections to be measured and the interval between them determined, a line is then to be extended down the main hatchway, at the middle line of the vessel, in a perpendicular direction.

(b) The distance of the midship tonnage section is then to be set off from this line in the same direction on the keelson, which gives the position of the midship section on the keelson, and the positions of the other sections are obtained on the keelson by setting off forward and abaft the midship section the common interval between sections as already determined. The position of the midship tonnage section may be determined by any other practical means.

§ 69.03-45 Transverse areas, rule for finding.

(a) Assuming the tonnage length exceeds 250 feet requiring that it be divided into 16 equal parts, and the tonnage depth at the middle of the tonnage length exceeds 16 feet, requiring it to be divided into 6 equal parts:

(1) Measure the depth at each of the 15 points of division of the length as required, also at the extreme forward point (Section 1) and at the extreme after point (Section 17) of the length. (See Figure 22 (§ 69.07-1).)

(2) The extreme points of the length at the bow and stern, though described as being the positions of the first and last areas, do not in vessels of usual form yield any area for practicable purposes. Therefore, in the computation for tonnage, where the first and last sections yield no areas, a cipher must be employed in their places. In vessels of unusual form, as, for instance, in barges or other craft in which the bow and stern are upright, with breadth also at those places, sections at the extreme points of the length will yield areas; in which cases such areas must be measured and used in the computation.

(3) Then measure the inside horizontal breadth at each of the five points of division of the depth, also at the upper and lower points of the depth.

(4) Number the breadths from above, numbering the upper breadth 1 and so on down to the lowest or seventh.

(5) Multiply the second, fourth, and sixth by 4, and the odd numbered breaths by 2, except the first and last which are multiplied by 1.

(6) Add these products together.

(7) Multiply the sum thus obtained by one-third of the common interval between the breadths, and the product shall be deemed the transverse area.

(8) This process will be repeated for every section.

(b) Having thus ascertained the transverse area, at each point of division of the length of the vessel, also at each end of the length if they yield areas, as required above, proceed to ascertain the register tonnage of the vessel in the following manner:

(1) Number the areas successively 1, 2, 3, etc., No. 1 being at the extreme limit of the length at the bow and the last number at the extreme limit of the length at the stern.

(2) Then multiply the second and every even numbered area by 4 and the third and every odd numbered area by 2, except the first and last which are multiplied by 1.

(3) Add these products together and multiply the sum thus obtained by one-third of the common interval between the areas, and the product will be the contents in cubic feet of the spaces under the tonnage deck.

(4) Divide this product by 100, and the quotient, being the tonnage under the tonnage deck shall be deemed the register tonnage of the vessel, subject to the additions hereinafter mentioned.

(c) In every case when finding the capacity under tonnage deck, or a part thereof; whether the length be divided according to the table into 6 or 16 parts, as in classes 1 and 6, or in 2 or 4 parts as provided for in § 69.03-47(a) and the depths into 4 or 6 parts, thus requiring 5 or 7 breadths respectively to be taken; the above formula shall be used; i.e., even numbered breadths shall be multiplied by 4, and odd numbered ones by 2 except the first and last which are multiplied by 1. Similarly when running areas through the multipliers, the even numbered ones shall be multiplied by 4 and odd numbered ones by 2, except the first and last, which are multiplied by 1.

§ 69.03-47 Breaks in double bottom.

(a) The tonnage length of a vessel having a break exceeding one-half of a foot in height, or a number of such breaks in the line of her double bottom, is to be divided into longitudinal parts establishing transverse vertical planes at such breaks. The length of each such part so found is then to be divided into a number of equal parts according to the class in the table appearing in § 69.03-41(a) to which it belongs, just as if it were the length of a separate vessel: *Provided,* That such parts as are 20 feet or under in length may be divided into 2 equal parts, and those above 20 feet and not exceeding 40 feet in length may be divided into 4 equal parts instead of into 6, as indicated in the table.

(b) When a vessel is required to be measured in parts, and each part measured as a separate vessel, the sum of the tonnages of the several parts is the capacity under the tonnage deck.

§ 69.03-49 Vessels having side tanks may be measured in parts.

Vessels having side tanks extending above the floor line or double bottom, and through which tanks tonnage breadths normally pass, may be measured in parts. The length of the first part will extend aft to the line of the forward bulkheads of the side tanks. (See Figures 23 and 24 (§ 69.07-1).) The length of the second part is equal to the length of side tanks, and the depths extend, at proper intervals under the tonnage deck, down to athwartship lines forming continuation of the side tank tops. (See Figure 25 (§ 69.07-1).) The third length immediately below the second part should equal that of the second. The breadths are taken between the inboard faces of the side tank bulkheads, and depths from athwartship lines forming continuation of the side tank tops. The fourth part will extend from a line athwart the after bulkhead of side tanks to a point aft where tonnage lengths usually terminate. Measure separately a side tank, the tonnage of which is to be doubled, assuming both tanks are identical as they usually are; then the sum of the tonnage of the several parts thus found shall be deemed the capacity under tonnage deck.

§ 69.03-51 Outside shaft tunnel.

To find the under deck tonnage of a vessel having an outside shaft tunnel, the shape of a section of which is usually the segment of a circle, measure the portion of the tunnel space included by the process of measurement in the under deck tonnage and subtract it therefrom. (See Figure 26 (§ 69.07-1).) Divide the length of such tunnel into a convenient number of equal parts, then find an area at the points of division of the length, also at the ends, if the end ones yield an area, by the following formula:

$$\text{AREA} = 2h \div 3(c)$$

c = Chord of the segment of a circle.
h = Height of segment (from chord to crown of arc).

Having found the required areas, proceed in the manner provided for using the areas as ordinates in determining under deck tonnage, finding the sum of even numbered areas multiplied by 4; the odd numbered areas multiplied by 2, except the first and last which are multiplied by 1. Then multiply the sum so found by one-third common interval between sections. The result divided by 100 gives the tonnage of the tunnel to be subtracted from the under deck tonnage found by ignoring initially the projection of the crown of the tunnel into the hold.

§ 69.03-53 Square end vessels having head blocks.

(a) In the case of vessels with square ends having head blocks extending from the deck to the bottom longitudinals on the rake of the bottom, the termini of the tonnage length will be at the inboard face of said block, and the area of the first and last section will equal the area of the inboard face of said block. (See Figure 27 (§ 69.07-1).)

(b) Should the head blocks extend inboard of the inboard face of the end frames (see Figures 28 and 29 (§ 69.07-1)), or should the head plates be excessive (see Figure 30 (§ 69.07-1)), consider the termini of the tonnage length to be at points inboard from the ends of the vessel, equal in distance to the thickness of the shell plating, depth of side frame, plus ceiling if fitted. Rubbing strakes to be excluded.

§ 69.03-55 Between decks.

(a) The tonnage of the space between the tonnage deck and the deck next above shall be ascertained as follows:

(1) Measure the inside length of the space at the middle of its height, from the ceiling at the side of the stem to the ceiling on the midship stern timber; or, if there is no ceiling take the length from a point forward where a continuation of the lines of inboard faces of the side frames intersect the center line of the vessel aft to the inboard face of the midship stern timber. Divide the length into the same number of equal parts into which the length of the tonnage deck is divided.

(2) Measure also at the middle of its height the inside breadth of the space at each of the points of division of the length, the breadth at the stem, and the breadth at the stern (if round, as in the case of poops of similar form). Number the breadths successively 1, 2, 3, etc., commencing at the stem.

(3) Multiply the second and all other even numbered breadths by 4 and the odd-numbered breadths by 2, except the first and last which are multiplied by 1. Multiply the sum of these products by one-third of the common interval between the points at which the breadths were taken; the result will give, in superficial feet, the horizontal area at the mean height of such space.

(4) Multiply the mean horizontal area by the average height taken between the planks of the two decks and the product will be the cubical contents of the space; which, divided by 100 shall be deemed the tonnage to be included among the items comprising the vessel's gross tonnage.

(b) The tonnage of each of the between decks above the tonnage deck shall be severally ascertained in the manner described above and shall be added as items comprising the vessel's gross tonnage.

§ 69.03-57 Superstructures.

(a) *Permanent erections.* Permanent erections; i.e., forecastle, bridge, poop, break, etc., on or above the upper deck, shall be measured tier by tier, and, exclusive of closed-in exemptible spaces, and open spaces, shall be included in the gross tonnage.

(b) *Length.* Measure at half height the mean length of such a space along its center longitudinal line, from and to the line of the inboard faces of the frames, or stiffeners, or ceiling if fitted. Divide the length into an even number of equal parts the common intervals of which shall be most nearly equal to that of the parts into which the tonnage length was divided. (See Figure 31 (§ 69.07-1).)

(c) *Breadths.* Measure at the middle of its height the inside breadths; namely, one at each end and one at each point of division of the length, numbering them successively 1, 2, 3, etc., the number one breadth being at the extreme forward end of the length.

(d) *Round-end erections.* If the after end of an ordinary poop or a house is in the form of a continuous arc of a curve, its breadth at the extreme after end of its length shall be one-half of the preceding breadth. If the after end of such a poop or house is in the form of an arc of a curve which is broken at its extreme after end by a decided flat, its breadth at the extreme after end of its length shall be two-thirds of the preceding breadth. (See Figures 32 and 33 (§ 69.07-1).)

(e) *Round-end erections.* If the forward end of a house is in the form of a continuous arc of a curve, its breadth at the extreme forward end of its length shall be one-half of the succeeding breadth. If the forward end of such a house is in the form of an arc of a curve which is broken at its extreme forward end by a decided flat, its breadth at the extreme forward end of its length shall be two-thirds of the succeeding breadth.

(f) *Multipliers.* Multiply the even numbered breadths by 4, and the odd numbered ones by 2, except the first and last which are multiplied by 1.

(g) *Horizontal area.* Multiply the sum of the products by one-third of the common interval between the points at which the breadths were taken; the result will give the horizontal area at the mean height of such space.

(h) *Height.* Multiply the mean horizontal area by the average height measured between the decks, or the extended line of same. (See B and C in Figure 9 (§ 69.07-1).) Divide the product by 100 and the quotient shall be deemed the tonnage of such space.

(i) *Superstructures having breaks.* Superstructures having breaks in their covering deck or side lines shall be measured in parts. (See Figure 34 (§ 69.07-1).)

(j) *Superstructures on small craft.* Superstructures on small craft shall be measured similar to the method for finding the gross tonnage of larger structures. When a superstructure is erected over a cut-away portion of the tonnage deck, the height of such superstructure is to be taken from the under side of its covering deck to a line of continuation of the tonnage deck. Should there be no camber to the tonnage deck, allow for same, in the covering deck of the erection if it exceeds 0.15 foot. After subtracting the tonnage of exemptible spaces in the superstructure, the remainder shall be listed under a name describing the erection, among the items comprising the gross tonnage.

(k) *Height of a turtleback.* The mean height of a superstructure referred to as a "turtleback" may be found by taking a height at each point of division of its length, at the after terminal of its length, and at one-third common interval abaft the forward end of the length. The sum of the heights so taken, divided by the number of heights, will give a sufficiently accurate mean height.

[CGFR 69-138, 34 FR 20131, Dec. 23, 1969; 35 FR 1104, Jan. 28, 1970]

§ 69.03-59 Hatchways.

(a) The cubical contents of the hatchways shall be obtained by multiplying the length and breadth together and the product by the mean depth taken from the top of the beam to the under side of the hatch cover. From the aggregate tonnage of the hatchways there shall be deducted one-half of 1 percent of the gross tonnage of the vessel exclusive of the tonnage of the hatchways, and the remainder only shall be added to the said gross tonnage as excess hatchways.

(b) The hatchways referred to are the ones out in the open or in open spaces on the upper deck to the hull and on closed-in deck erections. Hatchways on between decks and on the deck of open erections are not to be measured and included in the aggregate of hatchways from which the statutory deduction is to be made. The total hatchways on between decks and on the portion of the decks within closed-in erections on the upper deck to the hull are automatically included in the between-deck spaces and in the said erections by the process of measurement; and, of course, the hatchways on decks of open erections are not to be considered, serving as they do spaces not entering into the tonnage of the vessel.

§ 69.03-61 Record of exempted spaces.

The tonnage measurement of all spaces that the measurer has not included in the gross tonnage of the vessel must be recorded in detail on Form CG-1410, "Tonnage Admeasurement" which, when forwarded to the Commandant for examination and appropriate action must be accompanied by suitable plans or sketches drawn to scale, or a complete explanation for the proper consideration of the exemption of such spaces.

§ 69.03-63 Enclosed spaces exempted from inclusion in gross tonnage.

In addition to the spaces omitted from inclusion in gross tonnage under the provisions of § 69.15-3 on vessels measured in accordance with the provisions of Subpart 69.15, the following closed-in spaces situated on or above the upper deck shall not be included in the gross tonnage provided they are reasonable in extent, adapted and used exclusively for the purposes outlined:

(a) *Companions.* Companions and booby-hatches serving as a protection for companionways (stairways or ladderways) leading to spaces below, whether such spaces are exempted or not. (See a, b, c, and d in Figure 35 (§ 69.07–1).)

(b) *Galleys.* Spaces fitted with ranges or ovens (bakeries), without regard to the category of the persons they serve.

(c) *Light and air.* Spaces forming part of the propelling machinery space, or serving for the admission of light and air to such machinery shall be exempt under the heading of light and air. When no part of the propelling machinery extends below the upper deck, the space occupied by same is exemptible in its entirety together with such fuel bunkers as are located on or above the upper deck. Where fuel bunkers or tanks are located wholly or in part below the upper deck the space so occupied below the upper deck is not deductible.

(d) *Light and air on small boats.* (1) A house of reasonable size, into which the propelling machinery projects above the deck line, or a similar house used exclusively for light and air over such machinery on small boats is exempted, in its entirety, as light and air.

(2) A compartment of reasonable size, bulkheaded off and similarly used, located in a house serving other purposes is likewise so treated.

(3) When propelling machinery and/or light and air space, not bulkheaded off, is in a house serving other purposes, the actual length and breadth of the engine plus 2 feet each side and each end for working space, if such space is available, projecting up into the house becomes the length and breadth of exempted light and air, exclusive of such part as may be decked over and available for other purposes.

(4) If bunks, galley, supplies, etc., are located in the hull abreast the engine and under a house open to same, as described in preceding paragraph, and the 2-foot allowance for working space on each side of the engine base overlaps working space at galley, or as the case may be, allow one-half the actual breadth on each side the engine, which breadths plus the actual engine breadth projecting up into the house becomes the permissible breadth of light and air exemption.

(e) *Machinery spaces.* (1) Spaces occupied by machinery other than propelling machinery.

(2) The spaces occupied by dredging machinery on the upper deck of dredging vessels which are not self-propelled but which are required to be documented are to be exempted. No allowance is to be made for spaces occupied by such machinery below the upper deck.

(f) *Skylights.* Skylights and domes affording ventilation and light to the erection thereunder, except skylights over propelling machinery. None of the space below the covering deck of such erection shall be exempted from inclusion in tonnage unless an opening is left in the deck of the superstructure immediately under such skylight or dome to give ventilation and light to spaces below such deck line. (See exempted skylight and a, b, c, and d in Figure 36 (§ 69.07–1).) For the treatment of skylights over propelling machinery, see paragraph (c) of this section.

(g) *Special exempted water-ballast spaces.* (1) Any space other than the double-bottom space adapted only for water ballast, certified by the Officer in Charge not to be available for the carriage of cargo (other than ballast water for use for underwater drilling, mining, and related purposes, including production), stores, supplies, or fuel shall be deducted from the gross tonnage as measured to get gross register tonnage.

(2) Adaptation for water ballast consists of having the space or spaces properly constructed and tested as ballast tanks; that the pumps, pipes, etc., for filling and emptying such tanks must be of suitable dimensions, connected to the ballast system, and completely independent of the cargo, fuel oil, feed or domestic water pumping apparatus. Access shall be only through oval or circular manholes, whose greatest diameter must not exceed 2 feet in the watertight deck.

Where a hatch exists over a space now to be used for the carriage of water ballast, plating shall be fitted and riveted or welded to form a watertight cover and a manhole as above described may be fitted in this cover plate. Such manholes, except when fitted on the weather deck, may be provided with a coaming not exceeding 6 inches in height. If these spaces are found being used for purposes other than water ballast, they are to be added to the gross tonnage of the vessel, and so included until such changes have been made as will definitely preclude their use for purposes other than for water ballast.

(3) No space will be deemed to be adapted only for water ballast unless the Commandant is satisfied that the primary purpose of the space is to afford a means of maintaining stability, trim, immersion, seakeeping[1] capabilities, or strength conditions under varying conditions and requirements of the vessel's operation and that the space claimed for exemption is necessary to and available at all times for any one of these purposes. An application for exemption of water-ballast spaces in excess of 30 percent of the vessel's gross tonnage, calculated without any allowance for water ballast, shall be submitted for approval to the Commandant, accompanied by a statement in writing from the vessel owner or his representative as to the circumstances of use or construction of the vessel which make such an allowance necessary and proper and verifying that the conditions specified in this paragraph have been and are met. Any change in the facts on the basis of which a water-ballast exemption is granted under this section shall be promptly reported to the Officer in Charge for his determination as to whether there has been a change in the use of spaces requiring an adjustment of tonnage under § 69.05-9.

(h) *Water closets.* Any public room or compartment, if of reasonable size, fitted with hopper or hoppers, is, for admeasurement purposes, a water closet. This definition includes a room or a compartment designated as a toilet, fitted with urinal, or urinals, shower bath or shower baths, in addition to the hopper or hoppers. A crew water closet is considered public if it serves more than one member of the crew.

(i) *Wheelhouse.* The space for sheltering the man or men at the wheel. If the space is a combined wheelhouse and chart room, only such space as is necessary for the proper steering of the vessel shall be exempted. Should the space be partly above and partly below the upper deck, such part above the line of continuation of said deck is exemptible.

§ 69.03-65 Passenger cabins.

(a) Except as provided in § 69.15-3(b), passenger cabins and staterooms immediately on the upper deck to the hull, permanently close-in and fitted up for permanent use of passengers, are to be included in gross tonnage. They will be exempted only when they have no berthing accommodations and have only temporary arrangements to protect passengers on short voyages from rain and the shipment of seas, constituting sheltered spaces under cover and open to the weather; that is, not enclosed.

(b) Cabins and staterooms when assigned for use of passengers only, constructed entirely above the first deck which is not a complete deck to the hull (see § 69.03-19) may be exempted from inclusion in tonnage. In the case of Army transports, colliers, supply ships, hospital ships, etc., the term "passengers" shall include all officers, enlisted men, and other persons who are not assigned to ship's duties and not entered on the ship's articles, and no deductions for spaces occupied by such persons shall be made; nor are cabins and staterooms occupied by them when situated on a deck not a deck to the hull to be included in gross tonnage.

(c) For admeasurement purposes a cabin is defined as an apartment of a vessel, or the portion of the apartment that is assigned for the exclusive use of passengers. A cabin may consist of staterooms, bathrooms, toilets, libraries, writing rooms, lounges, dining rooms, saloons, smoking rooms, play rooms, etc., individually or collectively. The following spaces—smoking room, lounge, foyer, library, and similar public spaces, with or without a stateroom—would, for instance, be considered cabins. In short, any passenger stateroom or public space reserved entirely for the use of passengers is to be considered as coming under the meaning of the word "cabin."

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[1] The term "seakeeping" as used in this paragraph is defined as the ability of a vessel to maintain good behavior at its designed speed or at a speed as close as possible to its designed speed under all conditions of sea and weather, which the vessel may encounter in its designated service.

(d) A passenger stateroom is defined as an apartment, or one of the units of an apartment on a vessel, intended primarily to afford sleeping and/or other accommodations for passengers traveling alone or together.

§ 69.03–67 Open superstructures on or above the upper deck.

(a) *Treatment.* Nothing shall be added to the gross tonnage for any sheltered space on or above the upper deck which is under cover and open to the weather; that is, not enclosed.

(b) *Determination as to inclusion in gross tonnage.* In deciding whether or not superstructures are permanent closed-in spaces and should be included in tonnage, the measurer should have regard to the character and structural condition of such erections.

(c) *Tonnage openings.* A forecastle, bridge, poop, or any other permanent superstructure on or above the upper deck to the hull, with one or more openings in its sides or ends, not fitted with doors or other permanently attached means (except as provided for below) of closing them, shall be exempted from inclusion in gross tonnage if the opening or openings are in conformity with the following provisions:

(1) *Two 3 × 4 foot tonnage openings.* When there are in one of the end bulkheads, two tonnage openings, each 3 feet wide by 4 feet high in the clear, one on each side of the centerline of the end bulkhead.

(2) *One 4 × 5 foot tonnage opening.* When there is in one of the end bulkheads, as near as is practicable to the centerline of the space, one tonnage opening at least 4 feet wide by 5 feet high in the clear, or its equivalent. An equivalent opening is considered to be one of at least 20 square feet in the clear, resulting from a breadth in excess of 4 feet and a height of not less than 3 feet.

(d) *Intermediate bulkheads.* If the space is subdivided by intermediate bulkheads, such bulkheads shall have an opening or openings of the same dimensions as prescribed above.

(e) *Coamings.* If coamings are fitted to tonnage openings, their height must not exceed 2 feet at any part.

(f) *Permissible temporary closures for exterior bulkhead tonnage openings.* Tonnage openings prescribed for the above-mentioned superstructures may be temporarily closed by shifting boards dropped into channel sections at the sides of such openings, or by plates or boards held in place by hook bolts, spaced not less than 1 foot apart, fitting over the stiffener bar at the sides, top, and bottom of such openings, or by a plate or boards held in place by bolts and cross pieces so arranged as not to be held in place by cleats or other attachment to, or bolts through the bulkhead. (See Figures 37 to 43, inclusive (§ 69.07-1).) Cover plates, etc., must fay against the bulkheads.

(g) *Battening, gaskets, etc.* In no case is the use of battening, caulking, or gaskets of any material permitted.

(h) *Permanent fixtures.* Cleats, stud bolts, hinges attached to, or bolts in bulkheads at the edges of tonnage openings are prohibited as they are considered to be part of the means, in conjunction with plate or boards, of closing the tonnage opening.

(i) *Closures for interior bulkhead tonnage openings.* The same temporary means of closing the tonnage openings in interior bulkheads are permitted.

(j) *Enclosure within an open space.* An enclosure within an exempted space must be treated according to its use.

§ 69.03–69 Open shelter deck space.

(a) *Space between upper and shelter decks.* No space between the upper and shelter decks of a vessel shall be exempted from inclusion in gross tonnage as open shelter deck space unless there is in that shelter deck a permanent middle line tonnage opening which, except as provided in this paragraph, is at least 4 feet long in the clear and at least as wide, in the clear, as the after cargo hatch on that deck. If any such opening is less than the minimum size in the clear specified in this paragraph solely because one or more corners of that opening are rounded, that space shall be exempted, upon compliance with all applicable provisions of this section, in any case in which the radius of curvature of each such corner is not greater than 9 inches, or in any case in which a greater radius of curvature is required in writing by the Coast Guard or by a recognized classification society. In the latter case, a copy of that written requirement shall be filed with the Officer in Charge of the marine inspection zone in which the vessel is admeasured.

(b) *Position of middle line tonnage opening.* The distance between the after edge of this tonnage opening and the aft side of the sternpost must not be less than one-twentieth the register length of the vessel, or if the tonnage opening is forward, its fore side must not be less than one-fifth the register length of the vessel from the stem.

(c) *Coamings.* The coamings of the middle line tonnage opening must not exceed 12 inches extreme mean height above the deck, including the beading, etc., at the top for confining the hatch covers. If any such opening is guarded by rails or stanchions they shall be so arranged that they may not be used to secure or assist in securing a cover over that opening.

(d) *Cover.* (1) When portable wood covers are fitted they may be held in place by lashings fitted to the under side of the covers; lashings may be of hemp, manila, or other similar material.

(2) When a metal cover is used, it may be held in place by hook bolts spaced not less than 18 inches apart, passing through the cover plate and hooked over angle stiffeners or flanges fitted on the outside of the coamings; i.e., the bolts must not pass through the stiffeners or flanges on the coaming, nor must there be any other attachments on the coaming for fastening the cover.

(e) *Opening not be enclosed.* The middle line tonnage opening in a shelter deck must not be within a superstructure of any type.

(f) *Tonnage openings in shelter deck space.* When the permanent deck opening is situated aft, there must be at least two openings, each 3 feet wide by 4 feet high in the clear, in each of the transverse bulkheads within the shelter deck space forward of said deck opening; or should the deck opening be forward, the same requirements apply to transverse bulkheads abaft such forward deck opening.

(g) *Coamings.* Coamings, if fitted, must not exceed 2 feet in height at any part.

(h) *Temporary closure.* The same temporary means of closing tonnage openings in the bulkheads of the well under the middle line tonnage opening in the shelter deck and in the intermediate bulkheads, if any, in the shelter deck space are permitted as described in § 69.03-67(f).

(i) *Well under middle line tonnage opening.* The well under the middle line tonnage opening (in the shelter deck) must have a minimum length of 4 feet throughout its entire breadth and height, and shall be kept clear at all times.

(j) *Scuppers.* A scupper, having a 5-inch minimum inside diameter, fitted with a screw down nonreturn valve geared to and operated from the shelter deck, must be fitted on each side of the upper deck in way of the permanent middle line tonnage opening in the shelter deck. (See figure 44 (§ 69.07-1).)

(k) *Means for closing.* All openings in the upper deck to the hull must be provided with proper means for closing and battening down.

(l) *Closed-in spaces.* Any closed-in space within an open shelter deck space shall be treated according to its usage.

§ 69.03-71 An open structure on small craft.

(a) A house on a small craft is considered open to the weather and exempted from inclusion in tonnage provided the after end of such house is entirely open, from the under side of its roof beam down to a coaming not exceeding 3 inches in height, if there be a coaming, otherwise to the deck or line of same; and open in an athwartship direction from and to the inboard face of the end side stiffeners. (See Figures 45 and 46 (§ 69.07-1).) Closed-in spaces within an open erection will be treated according to their usage.

(b) Such an opening may be guarded by wire mesh screens and/or temporarily closed by canvas secured at the top and lashed down or buttoned in place at the sides and bottoms.

§ 69.03-73 Open vessels.

(a) In ascertaining the tonnage of open vessels the upper edge of the upper strake shall form the boundary line of measurement, and a tonnage depth shall be taken from a line athwart the upper edge of said strake, at each point of division and each end of the tonnage length.

(b) An open vessel is one of any length without a deck, or with only a partial deck or partial decks, the total length of which is less than one-half her tonnage length.

(c) Further, a vessel having a tonnage length of less than 50 feet and a partial deck of any length or a single full length deck, which, in either case, lies more than one-sixth of the midship depth below the line of the upper edge of the upper strake to the usual point in the hold for taking the register depth, shall, for admeasurement purposes, be deemed an open vessel unless it has a mechanically refrigerated hold or holds.

§ 69.03-75 Deductions from gross tonnage.

(a) *General.* To ascertain the net tonnage, the tonnage of the following spaces meeting certain requirements shall be deducted from the gross tonnage.

(b) *Requirements.* No space shall be deducted unless it has been included previously in the vessel's gross tonnage; is reasonable in extent for the purpose to which it is appropriated; and is certified by marking as prescribed in paragraph (c) of this section showing that it is used exclusively for such purpose.

(c) *Marking.* The following markings are required by paragraph (b) of this section: For each space appropriated exclusively for the use of the master, including the master's bathroom, bedroom, dressing room, observation room, office, reception room, sitting room, and water closet—"Certified for the Accommodation of Master"; for each space appropriated exclusively as a bedroom for the use of crew members, including officers other than the master—"Certified to Accommodate —— Seamen"; and for other deductible spaces—"Boatswain's Stores," "Chart House," "Dynamos," "Galley," "Hospital," "Messroom," "Office of Chief Engineer," "Pump Room," "Radio," "Steering Gear," "W.C." The following abbreviations may be used: "Cert. Accom. Master," "Cert. Accom. —— Seamen," "Cert. Boatswain's Stores," "Cert. Chart House," "Cert W. C." or "Cert. ——," inserting the space designation. The marking shall at all times be embossed, center-punched, or otherwise permanently cut in metal, and painted over with oil paint in a light color on a dark background, or a dark color on a light background, or carved or branded at least three-eighths of an inch in wood over the doorway, on the inside of the deductible space. Roman letters and Arabic numerals at least one-half of an inch in height shall be used and shall be readily legible at all times. If desired, the marking may be made on a plate of metal (but not of other material) permanently fastened in place by means of welding, riveting, or lock-type screws. The metal certification plates may be fastened in place to a metal door frame, on the inside of the space, by means of a metal-to-metal synthetic contact adhesive if the vessel owner or his agent satisfactorily establishes that the bonding agent is currently acceptable to the Coast Guard or the Department of the Navy for use on merchant ships or naval vessels for affixing metal hull label plates; and, further, certifies that the metal-to-metal bond will be accomplished in accordance with the techniques recommended by the manufacturer of the bonding agent.

(d) *Crew spaces.* The tonnages of the spaces or compartments exclusively occupied by and appropriated to the use of the officers and crew of the vessel including:

Bathrooms. A bathroom is a compartment or a room containing (1) a bath tub, or (2) a bath tub and a water closet, or (3) a shower bath or showers without a water closet regardless of its location.
Clothes drying room.
Drinking water filtration or distilling plant below deck.
Hospital.
Crew mess rooms.
Officers' mess rooms.
Office of chief engineer.
Oil skin locker.
Pantry.
Recreation room.
Shower baths.
Sleeping rooms.
Smoking rooms.
Water closets, private. A private water closet is defined as one intended to serve not more than one member of the crew, whose stateroom or bedroom affords the only means of entrance thereto and is treated as part of the room served by it. Other water closets are considered to be public water closets for admeasurement purposes.
Water closets, public—below the upper deck.
Passageways and companionways serving the above spaces.

But none of these spaces when used by the passengers on a passenger vessel are to be deducted nor is the clerk's, purser's, or paymaster's office deductible.

(e) *Nondeductible spaces on deductible passageway.* Lockers of less than 2 tons each, containing medicine, linen, mops, etc., for the free use of the crew; the ship's office, also spare rooms, not exceeding two in number and used as required by a pilot, customs officer, reserve engineer, a company official or employee shall not invalidate the deduction of a passageway serving as sole access to their location.

(f) *Master's cabin.* Any space exclusively for the use of the master. This space includes sleeping room, dressing room, bathroom, office, and passageways serving the master's accommodations.

(g) *Measuring deductible spaces.* Deducted spaces, rectangular in shape, are to be measured by taking the product of the three dimension, but when bounded by curved surfaces conforming to the sides of the vessel below the tonnage deck exceeding 15 feet in length, they are to be measured according to the formula on the back of Form CG-1410 for measuring peak tanks. When the space is less than 15 feet in length it may be measured by any practical method.

(h) *Platforms.* (1) When there is a platform, not more than 1 foot above the top of the bottom frames, to give a flat surface at the bottom of deductible spaces, and the space between the platform and said frames is not used for the stowage of gear, stores, etc., or for any other purpose, take depths of transverse sections to the top of the bottom frames and find areas as in the case of transverse sections for finding the tonnage below the tonnage deck. (See Figure 47 (§ 69.07-1).) P represents the platform 1 foot above the top of the bottom frames. A, B, and C are the positions of the sections. The forward section A, being sharp, yields no area.

(2) When the platform is more than a foot above the bottom frames, then find the areas only of the portion of the sections above the platform. (See Figure 48 (§ 69.07-1).)

(3) The depth of deducted spaces extending from the top to bottom of a deck erection may be taken between the same points as the depths used in finding the tonnage of the erection. In other words, if the erection was measured before the deck covering, if any, was laid and the ceiling or paneling, if any, overhead was fitted, and depths were taken from the underside of the covering planks or plating of the deck over as required by the law and regulations to the deck beneath, the deck covering and overhead ceiling are to be disregarded in obtaining depths of the various deducted spaces. In determining the number of men that may be berthed in a space the act of March 4, 1915 (38 Stat. 1165; 46 U.S.C. 660-1), is to govern.

(i) *Spaces in the between decks, etc.* Deducted spaces in the between decks or erections on or above the upper deck having curved sides are to be measured according to § 69.03-57.

§ 69.03-77 Navigation spaces.

(a) *Spaces used exclusively for navigation.* Spaces used exclusively for maneuvering or navigating the ship shall be deducted from the gross tonnage to the extent of what is considered reasonable. When the steering gear, anchor gear, helm, etc., are situated within a room unnecessarily large for the purpose, or are not partitioned off at all, a 2-foot allowance on every side of the apparatus may be made for working space. The height to be allowed should, as a rule, be the mean height of the between deck space.

(b) *Anchor gear.* The spaces below, occupied by anchor gear, include the capstan, windlass, and chain locker. When the fore peak is used exclusively as the chain locker, it is to be measured in the manner prescribed for measuring fore peak tanks when used for water ballast.

(c) *Boatswain's stores.* (1) Subject to the restrictions stated below, any space exclusively appropriated to and used for keeping the boatswain's stores may be deducted.

(2) The allowance for boatswain's stores shall be 1 percent of the gross tonnage in vessels of 100 gross tons and over, but this allowance shall in no case exceed 100 tons. In the case of vessels of less than 100 gross tons this deduction shall not exceed 1 ton.

(d) *Chart room.* (1) The space for keeping the charts, nautical instruments and for plotting the course. When the space is a combined wheel and chart room, such part as is not exempted as wheelhouse shall be deducted.

(2) In small vessels requiring the use of navigation charts, and where the cabin or saloon is the only space available for filing or use of such charts, one-half of the cabin or saloon, may be allowed for this purpose provided the allowance does not exceed 1½ tons.

(e) *Donkey engine and boiler.* (1) The space occupied by a donkey engine and boiler, if situated within the boundary of the engine room or the casing above it, and if the donkey engine is used as an auxiliary in connection with the main machinery for propelling the vessel and this space forms part of the actual engine room, it shall not be subject to a separate allowance.

(2) When the donkey engine and/or boiler is in a house above the upper deck and not used in connection with the main propelling machinery as described above, the space thus occupied is an exemption and therefore must not be included in the gross tonnage of the vessel.

(3) In all other cases the space occupied by the donkey engine and boiler, if same are connected with the main pumps (except cargo pumps) of the vessel, is to be allowed as a deduction from the gross tonnage, if reasonable in extent. It must be certified in the same manner as other deductible spaces.

(f) *Dynamo spaces.* The space or spaces when reasonable in extent, occupied by dynamos, switchboards and apparatus necessary for the operation of same, when located below the upper deck shall be deducted regardless of the service for which the dynamo or dynamos are used.

(g) *Pump room.* A pump room or space below the upper deck containing the pumps of the vessel which are used solely for handling ballast, feed water, water for cleansing purposes, and for freeing the ship of water entering her hold, etc., shall be deducted as pump room. A pump room or space below the upper deck containing pumps primarily used for handling cargo, as in the case of bulk-oil carriers, shall not be deducted. The portion of either of the above pump spaces above the upper deck is exemptible as machinery space.

(h) *Radio house.* The space set apart for sending and receiving wireless messages.

(i) *Storage of sails.* In the case of a vessel propelled wholly by sails, any space not exceeding 2½ percent of the gross tonnage of the vessel when such space is used exclusively for storage of sails.

§ 69.03–78 Deduction of spaces used for waste materials.

(a) *Definitions of waste materials.* Slop oil mixtures, tank cleaning residues, bilge residues, and other waste materials include:

(1) Liquid wastes resulting from flushing or cleaning the vessel's bilges,

fuel tanks, cargo tanks, and propulsion and operating systems.

(2) Residual solid and liquid wastes resulting from cleaning the vessel's bilges, and crew, passenger, cargo, and operating spaces.

(3) Solid and liquid wastes, including sewage, garbage, galley wastes, and trash, generaged by the vessel's own cargo, passengers, crew, and operating systems.

(b) *Use and marking of spaces to carry or process waste materials.* In determining a vessel's net tonnage, the following spaces are deducted from the gross tonnage if they meet the use and marking requirements of § 69.03-75 (a), (b), and (c) of this subpart and are no larger than necessary for the stated purpose:

(1) Space below the upper deck occupied by machinery used exclusively to separate, clarify, purify, or otherwise process a vessel's own—(i) slop oil mixture; (ii) tank-cleaning residue; (iii) bilge residue; or (iv) other waste material.

(2) Space either above or below the upper deck occupied by any tank or collection area used exclusively for the carriage or collection of any such slop oil mixture, tank-cleaning residue, bilge residue or other waste material generaged aboard the vessel.

(R.S. 4153, as amended, 88 Stat. 1694, 46 U.S.C. 77, 49 CFR 1.4(b) and 1.46).

[CGD 75-078, 43 FR 32109, July 24, 1978]

§ 69.03-79 Engine room.

(a) *Engine room must be measured.* Notwithstanding the ratable allowance for propelling power for which the act of March 2, 1895 (28 Stat. 741; 46 U.S.C. 77), provides, it is necessary to measure the engine room, regardless of size, in order to ascertain whether the allowance to be deducted for propelling power shall be regulated by a percentage of the gross tonnage or by the actual tonnage of the engine room ascertained by measurement.

(b) *Spaces included in engine room must be in gross tonnage.* No space shall be included in the tonnage of the engine room unless it has first been included in the vessel's gross tonnage.

(c) *Deductions from engine room.* Conversely the spaces occupied by cabins, storerooms, etc., and any space not used in connection with propelling the vessel but included in the tonnage of the engine room through process of measurement must be subtracted therefrom.

§ 69.03-81 Spaces included in engine room.

The space occupied by the engine room is to be understood to include not only that occupied by the engine room itself but also the space occupied by the boiler room, together with the spaces strictly required for the working of the engines and boilers, and consisting of the following items:

(a) *Space below the crown.* The crown or top of the main space of the actual engine room, from which the depths of the main space are to be taken, will either be at the under side of a deck or, if the side bulkheads are sloping, at the point or height at which the slope terminates. (See Figures 49 and 50 (§ 69.07-1).)

(b) *Space between crown and upper deck.* Space between the crown and the upper deck framed in for the machinery or for admission of light and air thereto.

(c) *Space above upper deck.* Space similarly framed in above the upper deck when permitted under paragraph (i), act of March 2, 1895 (28 Stat. 741; 46 U.S.C. 77).

(d) *Shaft tunnels, etc.* The shaft tunnel or tunnels and the thrust block recess.

(e) *Escape shaft.* The trunked ladderway leading from the after end of the shaft tunnel to the deck: *Provided,* That it is no larger than is necessary for the purpose of access to and escape from the shaft tunnel. The part of an escape shaft above the upper deck line, also the companion sheltering the escape shaft, is accorded the treatment of light and air space.

(f) *Fuel oil transfer pump.* (1) When the fuel oil transfer pump is located in a separate space, this space, if reasonable in size, may be considered propelling machinery space provided said pump is not used for bunkering the vessel.

(2) Should such pump perform the dual service of handling both ballast

and transferring the fuel oil to the settling tanks, one-half the space may be credited to propelling machinery space.

(g) *Settling tanks.* (1) Fuel oil settling tanks used solely for rendering crude oil fit for consumption in the main boilers are considered as part of the propelling machinery space.

(2) The permissible allowance for settling tanks is based on a 4 days' supply under full steam, which allowance must not exceed 1 percent of the vessel's gross tonnage.

(h) *Engineers' stores and workshops.* The engineers' stores, and/or workshops are regarded as part of the engine room, up to three-quarters of 1 percent of the gross tonnage, if in the engine room, open to same, or separated therefrom only by a screen bulkhead and located below the upper deck.

§ 69.03-83 Length of engine room.

(a) As a rule, the length of the engine room extends from the bulkhead forward of the boilers to the one aft of the engines; but if these bulkheads limit a space considered excessive in length for the proper working of the boilers and engines, then that length only which is requisite for containing and operating the boilers and machinery, is to be allowed, with the addition of such length as is necessary for the stoking or working of the fires when the furnaces are in a fore-and-aft direction.

(b) No such additional length is, however, required when the boilers are placed with the furnaces athwartship. The clear central space allowed between the boilers when the stoking is athwartship should be sufficient for this purpose. The point to which the after boundary of the length of the engine room is to be measured should be such as to provide sufficient space for the safe operation of the engine.

(c) The measurer should allow such length between the engines and boilers as may appear to him necessary for the safe working of the machinery.

§ 69.03-85 Boilers and engine in same compartment.

The boilers and engine are considered to be in the same compartment when there is a transverse bulkhead, screen or otherwise, through which the boilers project into the engine space, and where there is only sufficient space between the boilers and engine for the safe working of the machinery.

§ 69.03-87 Engine room measured in parts.

If the boilers and engine are entirely in separate rooms, or if there is a break or breaks in the bottom or side lines of the propelling machinery space resulting from a break or breaks in the double bottom or varying height of floors thereunder, or from side bunkers or other spaces not considered propelling machinery spaces, measure each room separately as a whole or in parts, according to the number of breaks in its bottom or side lines, and the sum of the several results shall be deemed to be the tonnage of the said spaces.

§ 69.03-89 Rule for measuring engine room.

(a) *Space in hold amidship.* When the propelling machinery (boilers and engines) space is in the hold amidship, and without a break in its bottom or side lines, measure its length between the foremost and aftermost bulkheads or limits of its length, excluding such parts, if any, not actually occupied by or required for the proper working of the machinery. Divide the length by 2 and measure 3 depths of the space, one at each end and one at the middle of the length, taking the depths from the crown, or line of same, to the ceiling on the bottom frames or floor timbers, or to the inner plating (tank top) of the double bottom in the case of a steel vessel. Measure also a breadth at each end and at the middle of the length, the said breadths to be taken at one-half their respective heights. Find the product of the length, mean breadth and mean depth, which product divide by 100 and the result shall be deemed the tonnage of the main space below the crown.

(b) *Spaces between the crown and upper deck.* Find the cubical contents of the space or spaces, if any, between the crown aforesaid and the upper deck, or line of same, which are framed in for the propelling machinery or admission of light and air thereto, by multiplying together the length, breadth and depth thereof. Divide the product by 100; and the quotient to the tonnage of the space below the crown and the result shall, subject to the provisions hereinafter contained, be deemed the tonnage of the space.

(c) *Engine room in after end.* When the propelling machinery space is located in the after end of the hold of a vessel and extends from side to side of same and has a continuous bottom line, divide its length into such an even number of parts as will give a common interval most nearly equal to that used in finding the tonnage of the hold in that part of the vessel; then proceed to find its contents by the use of areas of transverse sections taken at each end and at each point of division of its length. In other words, measure it by the same method as was used for finding the tonnage of that part of the hold in which it lies.

(d) *Shaft tunnel and thrust recess.* (1) In the case of screw propelled vessels in which the top of the shaft tunnel is flat, the tonnage of such tunnel shall be ascertained by dividing the product of its length, breadth and depth by 100.

(2) In like manner find the tonnage of the thrust recess or entrance to the shaft tunnel.

(3) If the space abaft the shaft tunnel extends from side to side of the vessel, find its tonnage by using the formula for measuring peak tanks. (See Figures 47 and 48 (§ 69.07-1).)

(e) *Round top shaft tunnel.* When the top of the tunnel is practically semicircular in shape, find the area of a transverse section in two parts; first the lower part from the bottom of the trunk up to where the curve begins by multiplying the breadth by the applicable height, and then the semicircular part by taking half the area of a circle whose diameter equals the breadth of the tunnel. Multiply the sum of the two areas by the length and divide the product by 100. (See Figure 51 (§ 69.07-1), wherein B and H equal the breadth and height, respectively, of the lower part, and r equals the radius of the semicircular top.)

(f) *Shaft space and thrust recess not cased.* (1) When the shaft is not enclosed by a tunnel, the following rules should be observed in the case of a vessel with a single screw. The thrust-block space should be of such length and breadth as will permit of the proper care of the thrust-block and the height should not exceed 7 feet. The shaft space allowed should be of the dimensions of the usual tunnel suitable for the vessel and the height of this pace should not exceed 6 feet.

(2) When the vessel is a twin screw and the space aft of the engines is open from side to side, the space should not be included in the engine room measurement for a greater height than 6 feet mean, and any space therein appropriated for stores or for any purposes other than the propelling machinery should be subtracted from the space to be included in the engine room.

§ 69.03-91 Engine room in small boats.

(a) *When not bulkheaded off.* In the case of a motorboat not having an engine room bulkheaded off from the rest of the hold, allow as engine space the space occupied by the engine and sufficient space on each side and end of it—say, about 2 feet—to permit the operator to handle it safely and efficiently; if sufficient space does not exist for such allowance then allow whatever space there is. Fuel tanks are not to be included in the said engine space.

(b) *When bulkheaded off.* If the engine room is bulkheaded off from the rest of the hold and is larger than is strictly required for safe and efficient handling of the engine, limit the engine space according to the said requirements and as indicated in paragraph (a) of this section.

(c) *Engine on a bed.* If the engine sits on a bed located on the vessel's bottom timbers, take depths when measuring the propelling machinery space from the under side of the deck, or line of same down to the top of the bottom frames or floor timbers as the case may be, or to the ceiling thereon when fitted.

(d) *Boxed-in engine.* (1) When the portion of the engine extending above a cockpit platform is boxed in such boxed-in portion is considered to be all of the space available for the installation and operation of the engine above the line of said platform in that part of the vessel.

(2) In the case of a wholly boxed-in engine in the hold of a motorboat, the tonnage of the boxed-in space, plus the shaft, engine auxiliaries, etc., that may be outside the boxing is considered the propelling machinery space.

(3) The above restrictions may invalidate light and air exemption when the boxing does not extend above the line of the upper deck. However, when such boxing does extend above said deck line, the height of light and air exemption is from the upper deck line to the under side of the top of the boxing.

§ 69.03–93 Deduction for propelling power.

In the case of a vessel propelled by steam or other power, a deduction shall be made for the propelling machinery space according to the percentage ratio between the actual tonnage of such space and the vessel's gross tonnage, calculated as follows:

For vessels propelled by screw in whole or in part:

13 percent or less: Deduct $^{32}/_{13}$ times the tonnage of the actual propelling machinery space; or, in the case of a vessel the construction of which was commenced on or before June 4, 1956, if the owner so elects, deduct 1¾ times the tonnage of the actual propelling machinery space.

Above 13 percent, below 20 percent: Deduct 32 percent of the gross tonnage.

20 percent or more: Deduct 32 percent of the gross tonnage or 1¾ times the tonnage of the actual propelling machinery space, whichever the owner elects.

For vessels propelled by paddle-wheel in whole or in part:

20 percent or less: Deduct $^{37}/_{20}$ times the tonnage of the actual propelling machinery space; or, in the case of a vessel the construction of which was commenced on or before June 4, 1956, if the owner so elects, deduct 1½ times the tonnage of the actual propelling machinery space.

Above 20 percent, below 30 percent: Deduct 37 percent of the gross tonnage.

30 percent or more: Deduct 37 percent of the gross tonnage or 1½ times the tonnage of the actual propelling machinery space, whichever the owner elects.

§ 69.03–95 Light and air spaces.

(a) *Application for allowance.* On a request in writing by the owner of a vessel to the Officer in Charge of the marine inspection zone in which the vessel is located, the tonnage of such portion of the space or spaces above the crown of the engine room and above the line of the upper deck as is framed in for the machinery, or for the admission of light and air, and not required to be included in the gross tonnage, shall for the purpose of ascertaining the tonnage of the space occupied by the propelling machinery, be added to the said machinery space; but it shall then be included in the gross tonnage. Such space or spaces must be reasonable in extent, safe, and seaworthy and cannot be used for any purpose other than the machinery or for the admission of light and air to the propelling machinery space of the vessel.

(b) *Reasonable in extent.* In construcing the words "reasonable in extent" the measurer should note that the length should not exceed the length of the propelling machinery space, and if any portion is plated over, the length of such part must be deducted from the full length and whatever the breadth of the casing may be, the breadth allowed must not exceed one-half the extreme inside midship breadth of the vessel.

(c) *Purpose for including light and air spaces.* The purpose of adding a part of the framed-in light and air spaces (above the crown of the boiler and engine room and above the upper deck) of a vessel to her machinery space below the upper deck is to entitle the vessel to a greater deduction for propelling power, and consequently obtain a smaller net tonnage than would otherwise result. To get this benefit, it does not always require the addition of the total of such light and air spaces. In such cases only such portion need be added as hereinafter explained.

(d) *Rule for computing addible light and air space.* Below is given a simple rule for finding the amount of light and air space or spaces required to be added to the gross tonnage and also to the propelling machinery space of a mechanically propelled vessel to entitle her to 32 percent of her gross tonnage for propelling-power deduction when granted by the Officer in Charge upon request of her owner or owners:

Find 13.1 percent of the gross tonnage inclusive of excess hatchways. Find the difference between this percent and the tonnage of the propelling machinery space below the upper deck to the hull. Increase this difference by 15 percent of itself, which gives approximately the amount of light and air space or spaces to be added to the gross tonnage defined above, and also to the propelling machinery space below said upper deck. The gross register tonnage in such a case is the gross tonnage as defined above, plus light and air addition, less one-half of 1 percent of said light and air addition, which one-half percent is additional allowance for excess hatchways due to addition of light and air to gross tonnage.

EXAMPLE

Gross tonnage, exclusive of light and air and hatchways		5,675.95
Excess of hatchways (based on the above)		67.37
Gross tonnage, inclusive of excess hatchways and exclusive of light and air		5,743.32
13.1 percent of 5,743.32	752.37	
Machinery space below the upper deck to the hull	680.55	
Difference	71.82	
15 percent of difference	10.77	
Difference plus 15 percent of itself (amount of light and air to be added to gross tonnage and machinery space)		82.59
Gross tonnage, inclusive of light and air and excess of hatchways		5,825.91
Additional exemption for hatchways; account of light and air addition equals one-half of 1 percent of 82.59=82.59/200		0.41
Gross registered tonnage		5,825.50
Proof:		
13.1 percent of 5,825.50		763.14
680.55 plus 82.59		763.14

§ 69.03-97 Verification of calculations, diagram of areas, and certification of results.

(a) *Calculations to be verified and diagram of areas made.* Calculations must be verified at least twice and a diagram of half breadths for areas made. (See Figures 52 and 53 (§ 69.07-1).)

(b) *Certification of results.* The deductions having been made from the gross tonnage and the remainder or net tonnage having been properly marked on the main beam, the surveyor or measuring officer will certify the result to the Officer in Charge on Form CG-1322.

Subpart 69.05—Miscellaneous Provisions

§ 69.05-1 Marking net tonnage and official number on vessel.

(a) The official number of a vessel preceded by the abbreviation "No.", and the net tonnage, preceded by the word "NET", shall be marked in a conspicuous place on her main beam at the expense of the owner or master, in Arabic numerals of the block type at least 3 inches in height, when the size of the main beam will permit. If the main beam is of wood, it shall be carved or branded in figures not less than three-eighths of an inch in depth. If the main beam is of iron or other metal, the official number and net tonnage shall be outlined by punch marks and painted over with oil paint in a light color on a dark background or a dark color on a light background.

(1) In the case of a vessel which is assigned two net tonnages under the provisions of § 69.15-17(b), both net tonnages shall be marked on the vessel. Immediately following the lower net tonnage there shall be marked a copy of the tonnage mark and the triangle which may be scaled to the size of the numerals.

(2) In the case of a vessel which is assigned a single net tonnage under the provisions of § 69.15-17(c), a copy of the tonnage mark and the triangle shall be similarly marked after the net tonnage as provided by paragraph (a)(1) of this section.

(b) The beam at the forward end of the largest hatch on the weather deck which is generally located forward of amidships shall be considered the main beam for the purposes of this part. In the case of a vessel which does not have a hatch on the weather deck, any structural member which is integral to the hull may be considered the main beam.

(c) The official number awarded to a vessel shall pertain only to that vessel.

If a vessel, having once received an official number, is rebuilt or redocumented, the number originally awarded shall be retained.

§ 69.05-3 Appendix to certificate of registry.

(a) When a vessel of the United States carries passengers to a foreign port or ports the Officer in Charge will issue to each such vessel admeasured in his marine inspection zone a "Special Appendix to Certificate of Registry of American Passenger Vessels" (Form CG-1265-A), showing the tonnage of passenger spaces on a deck not a deck to the hull and exempted from inclusion in tonnage by the regulations in this part.

(b) The same requirement applies to vessels operating from his marine inspection zone not previously furnished such an appendix.

(c) At the end of each quarter, the Officer in Charge must report to the Commandant the official number and name of every vessel in his marine inspection zone to which such appendix has been issued during that period.

§ 69.05-5 Measurement of Government vessels.

When the tonnage of Government colliers, transports, supply ships, repair ships, etc., is requested this tonnage shall be ascertained in accordance with the rules in this Part, but the following requirements will be waived: The marking of the vessel's name and home port, official number (none required), and net tonnage; the requirements as to size and conditions of crew space, and the certifications of deducted spaces on the beam over the doorway. The plate over the door designating its use is sufficient for such certifications.

§ 69.05-7 Foreign vessels.

A mode of measurement for the tonnage of vessels substantially similar to that of the United States having been adopted by Belgium, Cambodia, Central African Republic, Denmark, Federal Republic of Germany, Finland, France, Gabon Republic, Great Britain, Greece, Iceland, Israel, Italy, Japan, Liberia, Malagasy Republic, the Netherlands, Norway, Pakistan, Panama, Polish People's Republic, Portugal, Republic of Senegal, Spain, Sweden, Union of Soviet Socialist Republics, Venezuela, and Yugoslavia, and the like courtesy having been extended to vessels of the United States, it is directed that merchant vessels of these countries, the registers of which indicate their gross and net tonnages under their present laws, shall be taken in ports of the United States to be of the tonnages so expressed in their documents. Vessels of foreign countries other than the aforesaid are to be measured according to the laws of the United States.

§ 69.05-9 Adjustment and correction of tonnage.

(a) If there has been a change of structure or use of space that affects tonnage, or, if the owner or his agent claims that either the admeasurement procedure or the officially assigned tonnages are in error, an application for adjustment of tonnage shall be made as provided in § 69.01-17. The application shall be accompanied by appropriate drawings as outlined in § 69.01-19 and by a precise statement of the alterations, changes in use of spaces, or assignments of error.

(b) The Officer in Charge shall not readmeasure unaltered spaces or spaces for which no error is claimed, but shall use the figures shown on the latest record of tonnage admeasurement (Form CG-1410 or 1410-A), unless there is an obvious error therein. If the vessel was previously admeasured at a port other than the port at which application for adjustment of tonnage is made, the record of tonnage admeasurement or a copy thereof shall be forwarded to the Officer in Charge at the latter port upon his request.

(c) The Officer in Charge shall determine the proper tonnage of the vessel. If the tonnage is found to be different from that shown in the vessel's outstanding document, he shall prepare a new record of admeasurement.

(d) When the application for adjustment of tonnage is based on a claim of error, or when an error is discovered by the Officer in Charge, he shall consider the matter and make any necessary tonnage adjustment. If a claim is denied by the Officer in Charge, the claimant may request review of the matter by the Commandant. Any such request for review shall be forwarded through the office of the Officer in Charge concerned to the Commandant with the supporting papers and the recommendation of the Officer in Charge.

(e) The outstanding document of the vessel shall be surrendered incident to any adjustment or correction of tonnage and any document issued to that vessel thereafter shall show the adjusted tonnage.

Subpart 69.07—Figures and Tables

§ 69.07-1 Figures.

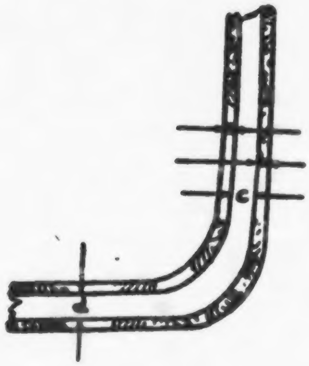


FIGURE I.

a: THICKNESS OF CEILING
b: THICKNESS OF OUTER PLANKING
c: DEPTH OF SIDE FRAMES
d: DEPTH OF BOTTOM FRAMES OR FLOORS

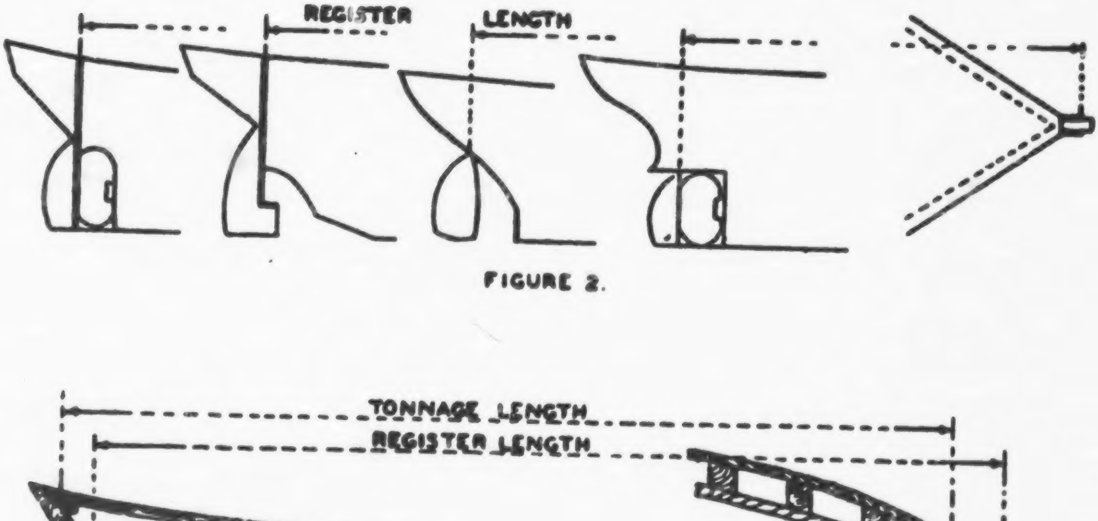

REGISTER
LENGTH

FIGURE 2.

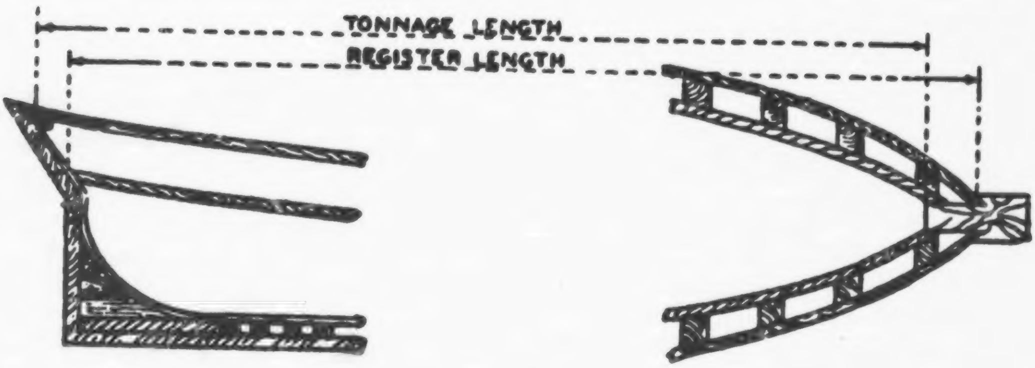

TONNAGE LENGTH
REGISTER LENGTH

FIGURE 3.

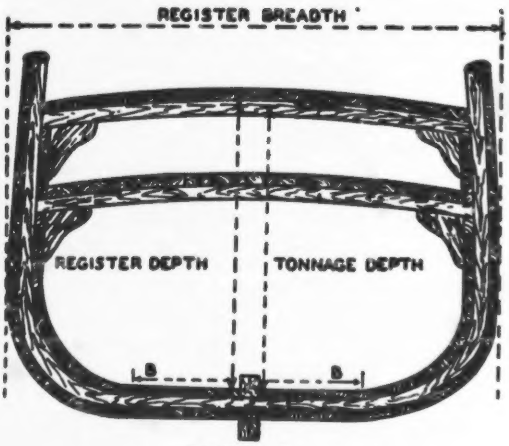

REGISTER BREADTH
REGISTER DEPTH
TONNAGE DEPTH
B
B

FIGURE 4.

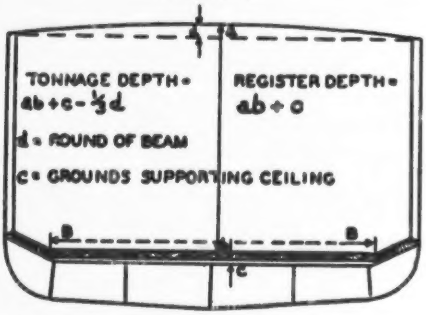

a
d
TONNAGE DEPTH = ab + c - ⅓d
REGISTER DEPTH = ab + c
d = ROUND OF BEAM
C = GROUNDS SUPPORTING CEILING
B
B
C

FIGURE 5.

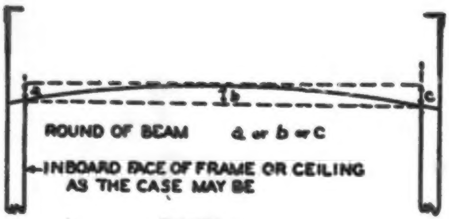

a
b
c
ROUND OF BEAM a or b or C
INBOARD FACE OF FRAME OR CEILING AS THE CASE MAY BE

FIGURE 6

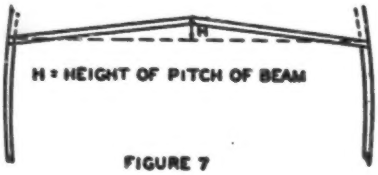

H
H = HEIGHT OF PITCH OF BEAM

FIGURE 7

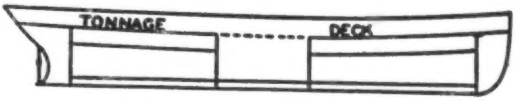
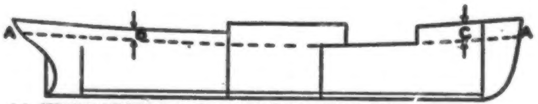

TONNAGE
DECK

FIGURE 8



AA TONNAGE DECK AND LINE OF CONTINUATION
B HEIGHT OF BREAK ABOVE LINE OF TONNAGE DECK
C HEIGHT OF RAISED FORECASTLE

FIGURE 9

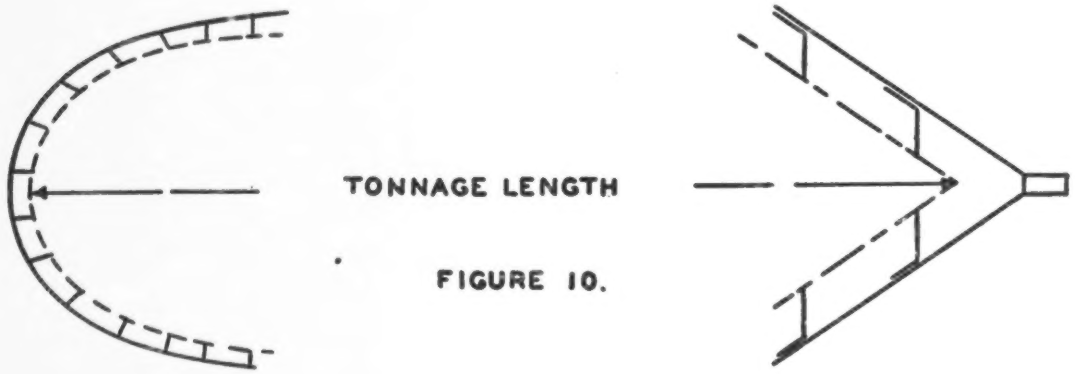

TONNAGE LENGTH

FIGURE 10.

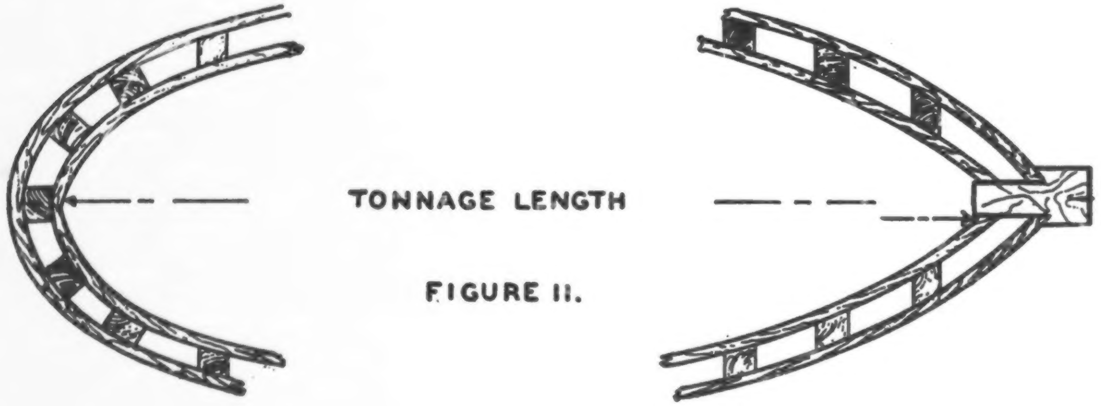

TONNAGE LENGTH

FIGURE 11.

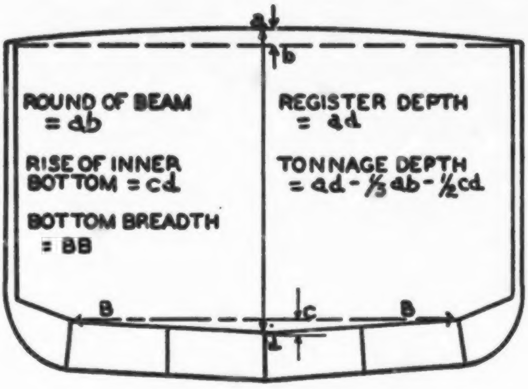

a
b
ROUND OF BEAM = ab
REGISTER DEPTH = ad
RISE OF INNER BOTTOM = cd
TONNAGE DEPTH = ad - ⅓ab - ½cd
BOTTOM BREADTH = BB
B
c
B
d

FIGURE 12.

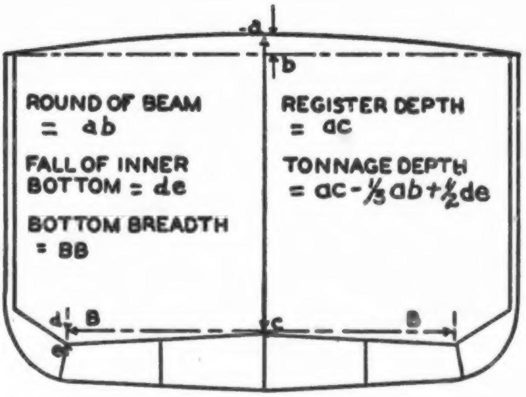

a
b
ROUND OF BEAM = ab
REGISTER DEPTH = ac
FALL OF INNER BOTTOM = de
TONNAGE DEPTH = ac - ⅓ab + ½de
BOTTOM BREADTH = BB
d
B
c
B
e

FIGURE 13.

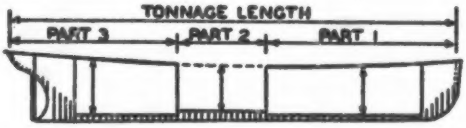

TONNAGE LENGTH
PART 3
PART 2
PART 1

FIGURE 14.

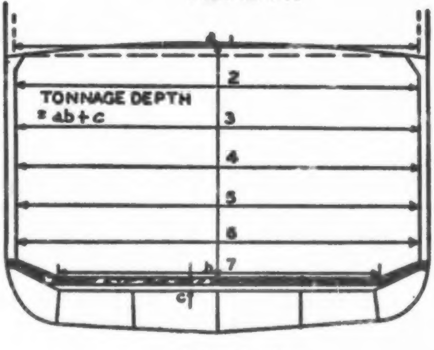

a
2
TONNAGE DEPTH = ab+c
3
4
5
6
b
7
c

FIGURE 15.

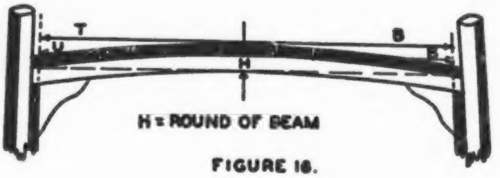

T
B
H
H = ROUND OF BEAM

FIGURE 16.

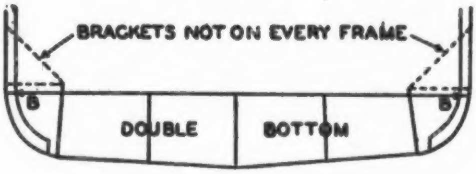

BRACKETS NOT ON EVERY FRAME
B
B
DOUBLE BOTTOM

FIGURE 17.

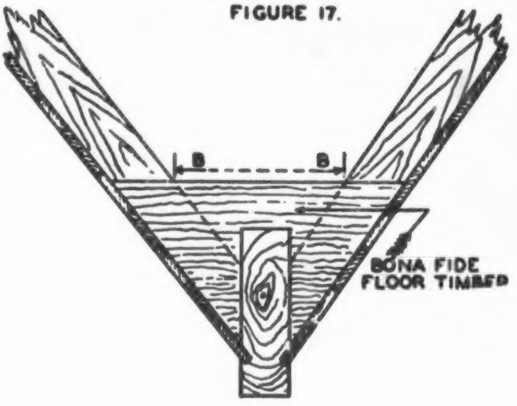

B
B
BONA FIDE FLOOR TIMBER

FIGURE 18

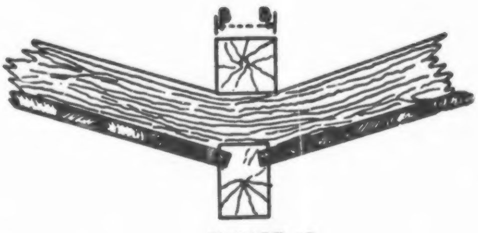


FIGURE 19.

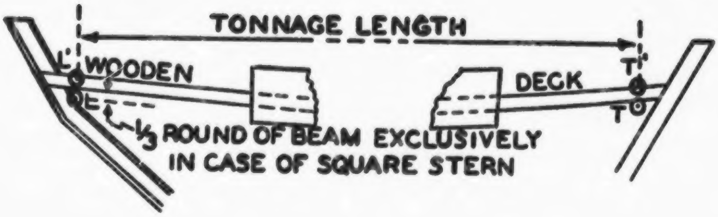

TONNAGE LENGTH
L'
L
WOODEN
DECK
T'
T
$\frac{1}{3}$ ROUND OF BEAM EXCLUSIVELY IN CASE OF SQUARE STERN

FIGURE 20.

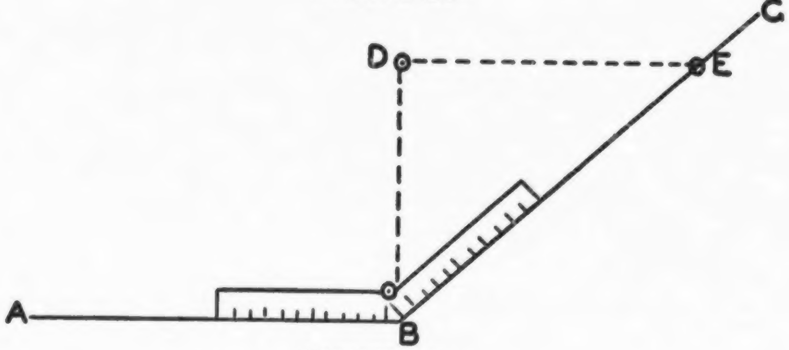


FIGURE 21.

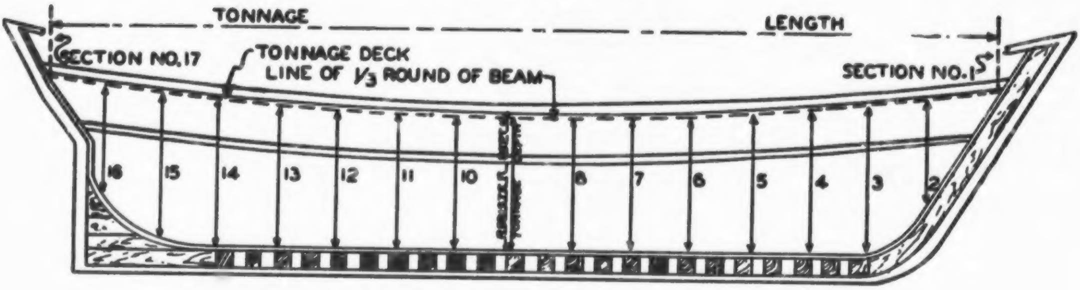

TONNAGE
LENGTH
SECTION NO.17
TONNAGE DECK
LINE OF $\frac{1}{3}$ ROUND OF BEAM
SECTION NO.1
16
15
14
13
12
11
10
8
7
6
5
4
3
2

FIGURE 22

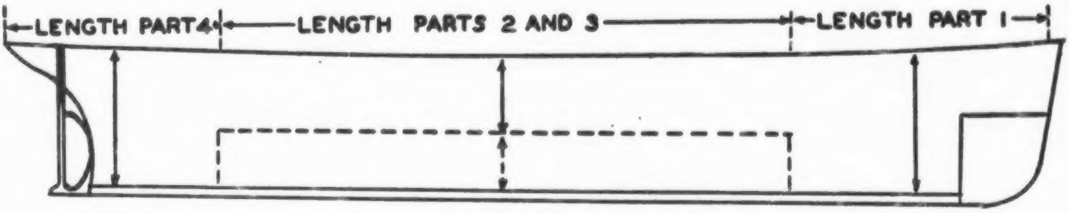

LENGTH PART 4
LENGTH PARTS 2 AND 3
LENGTH PART 1

FIGURE 23.

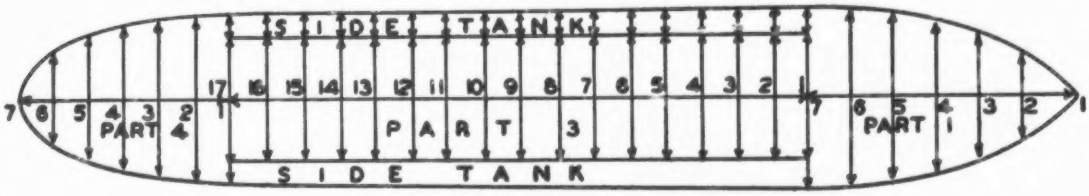

SIDE TANK
17
16
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
7
6
5
4
3
2
1
PART 4
PART 3
7
6
5
4
3
2
1
PART 1
SIDE TANK

FIGURE 24.

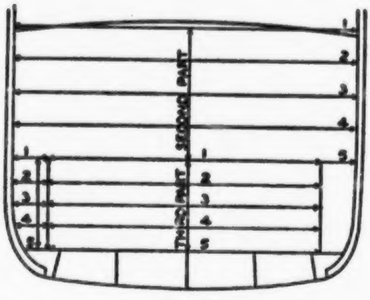

1
2
3
4
5
STRONG PART
THIRD PART
1
2
3
4
5
1
2
3
4
5

FIGURE 25

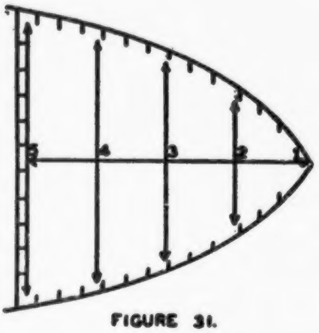


FIGURE 31.

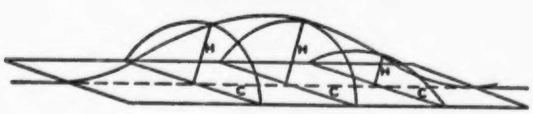


FIGURE 26

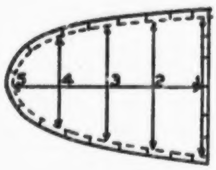


FIGURE 32.

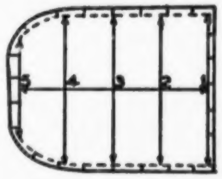


FIGURE 33.

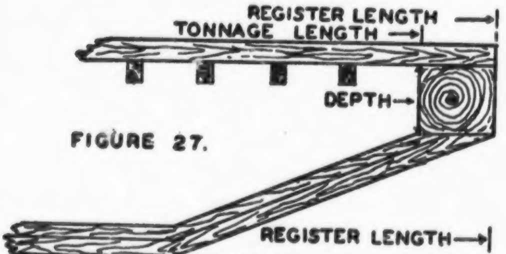

REGISTER LENGTH
TONNAGE LENGTH
DEPTH

FIGURE 27.

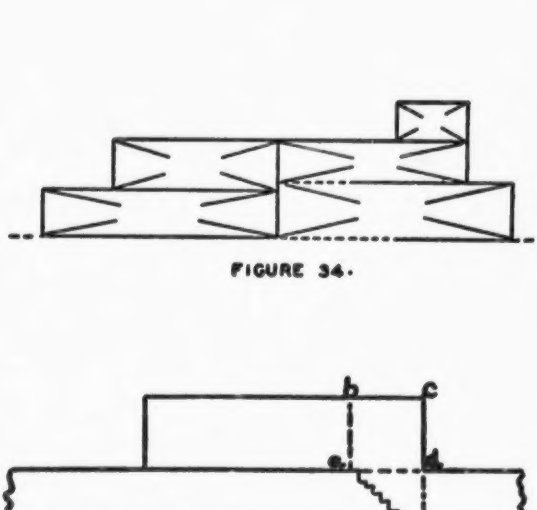


FIGURE 34.

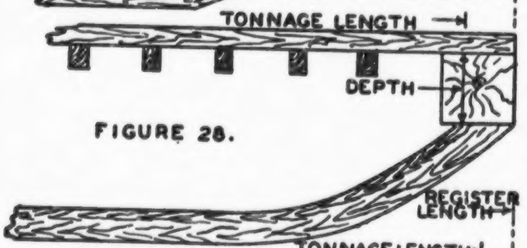

REGISTER LENGTH
TONNAGE LENGTH
DEPTH

FIGURE 28.

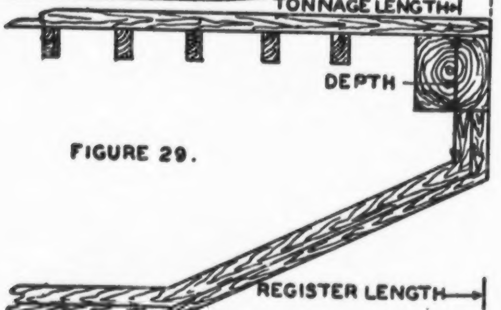

REGISTER LENGTH
TONNAGE LENGTH
DEPTH

FIGURE 29.

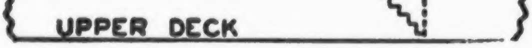

b
c
a
d
UPPER DECK

FIGURE 35.

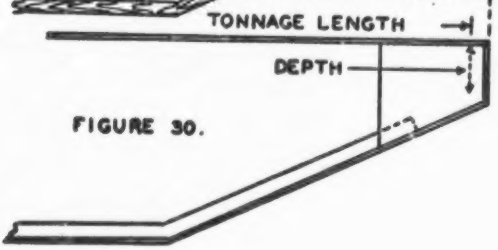

REGISTER LENGTH
TONNAGE LENGTH
DEPTH

FIGURE 30.

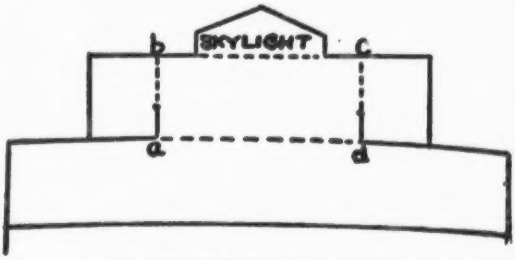

SKYLIGHT
b
c
a
d

FIGURE 36.

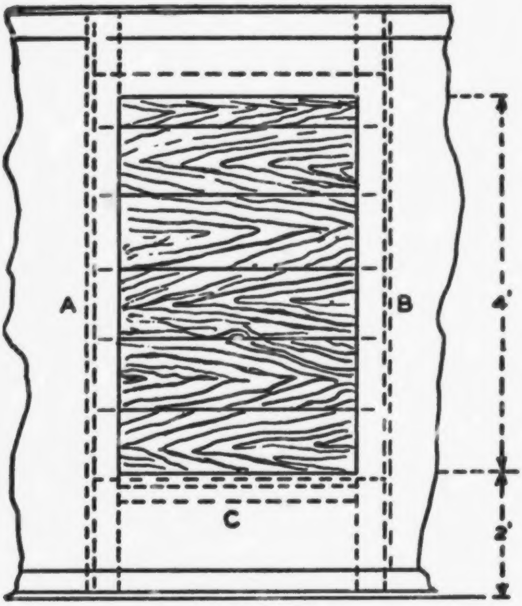


FIGURE 37.

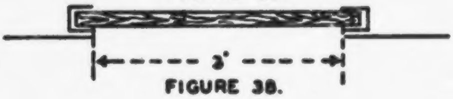


FIGURE 38.

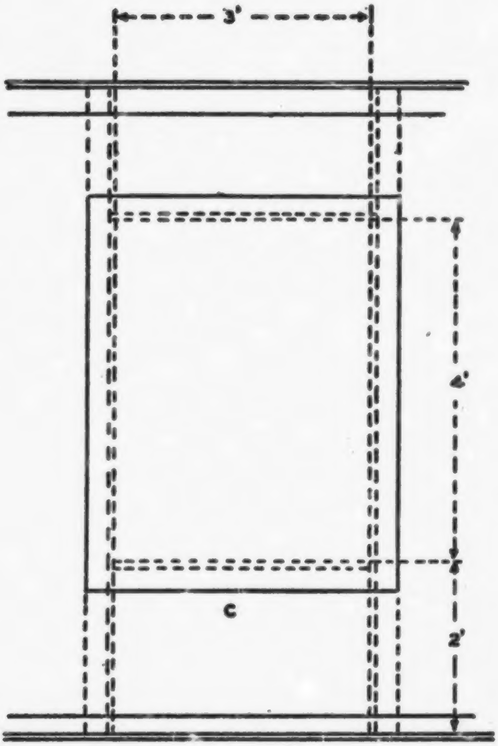


FIGURE 39

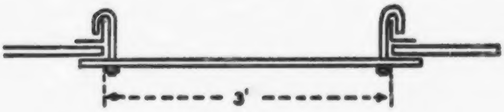


FIGURE 40

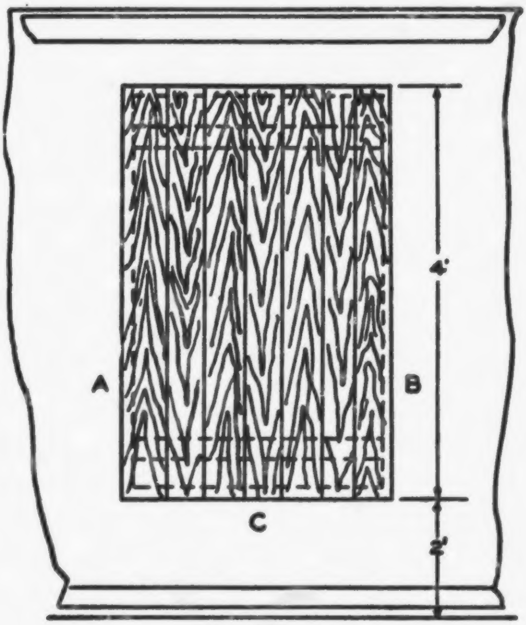


FIGURE 41.

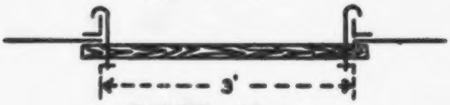


FIGURE 42.

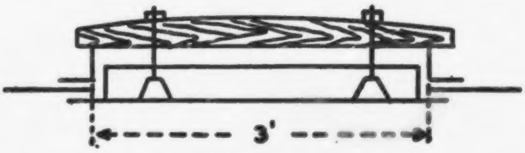


FIGURE 43.

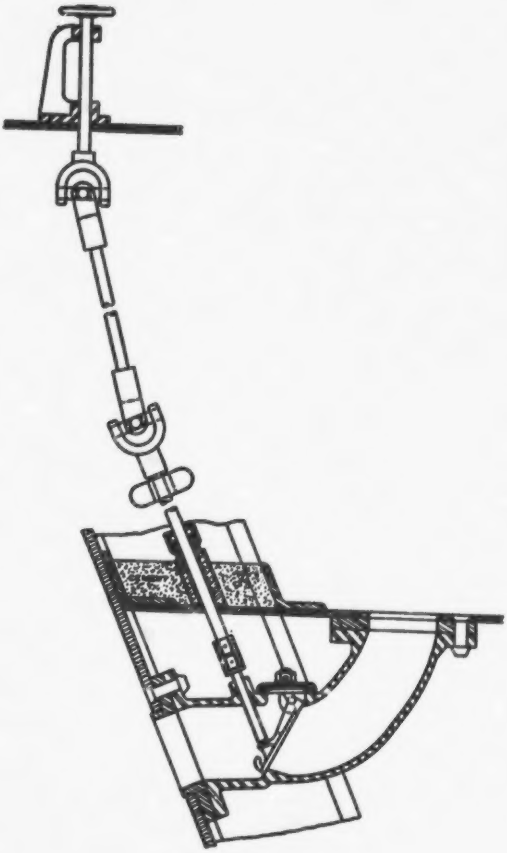


FIGURE 44.

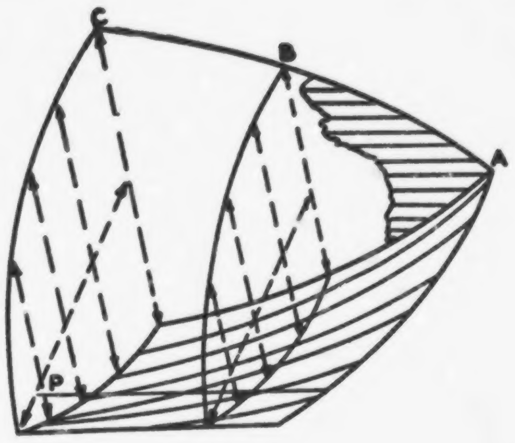


FIGURE 47.

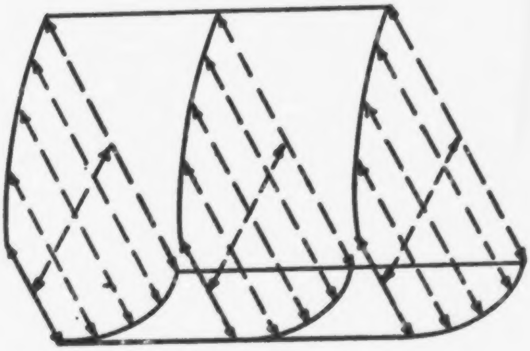


FIGURE 48.

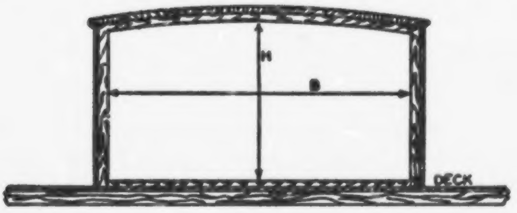


FIGURE 45.

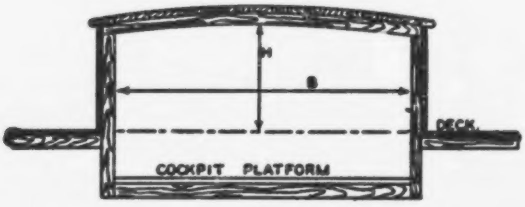

H
B
DECK.
COCKPIT PLATFORM

FIGURE 46.

H= HEIGHT OF OPENING
B= BREADTH OF OPENING

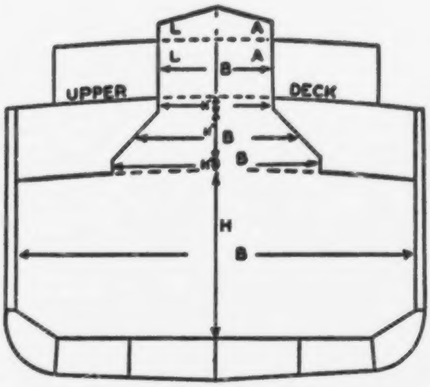

L
A
L
A
B
UPPER
DECK
H'
B
H'
B
H
B

FIGURE 49.

H = HEIGHT OF MAIN SPACE
H'+ H'+ H' = HEIGHT BETWEEN CROWN AND UPPER DECK
L. A. = LIGHT AND AIR SPACE ABOVE UPPER DECK
B = BREADTH

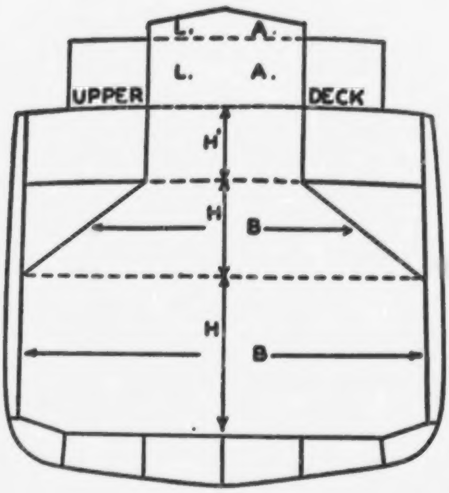

L. A.
L. A.
UPPER DECK
H'
H
B
H
B

FIGURE 50.

H + H = HEIGHT OF MAIN SPACE
H' = HEIGHT TWEEN CROWN & UPPER DK.
B = BREADTH
L. A. = LIGHT AND AIR SPACE ABOVE UPPER DK.

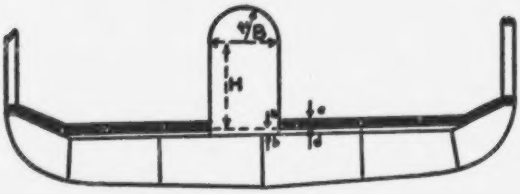


FIGURE 51.

ab = cd = THICKNESS OF CEILING

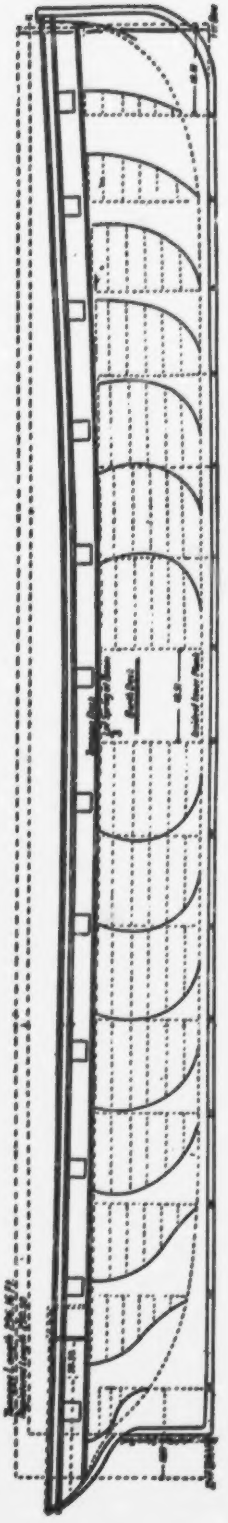


FIGURE 52.

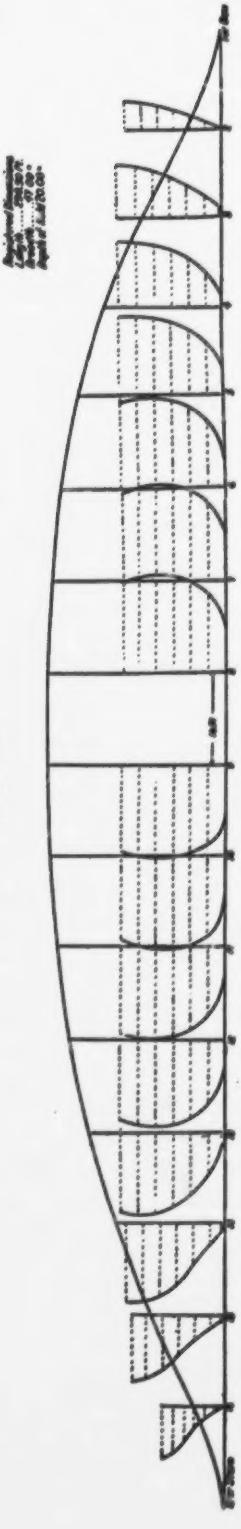


FIGURE 52.

§ 69.07–3 Conversion table for finding the decimal equivalent of inches.

For finding the decimal equivalent of inches, the following table will be found useful:

DECIMAL EQUIVALENT OF INCHES

	Equivalents in decimals of a foot
11 inches	0.92
10 inches	.83
9 inches	.75
8 inches	.67
7 inches	.58
6 inches	.50
5 inches	.42
4 inches	.33
3 inches	.25
2 inches	.17
1 inch	.08
¾ inch	.06
½ inch	.04
¼ inch	.02

§ 69.07–5 Conversion table for reduction of tons to cubic meters.

For converting tons into cubic meters, the following table will be found useful:

REDUCTION OF TONS TO CUBIC METERS

	Meters
1 ton	2.83
2 tons	5.66
3 tons	8.49
4 tons	11.32
5 tons	14.15
6 tons	16.98
7 tons	19.81
8 tons	22.64
9 tons	25.47
10 tons	28.30
11 tons	31.13
12 tons	33.96
13 tons	36.79
14 tons	39.62
15 tons	42.45
16 tons	45.28
17 tons	48.11
18 tons	50.94
19 tons	53.77
20 tons	56.60
21 tons	59.43
22 tons	62.26
23 tons	65.09
24 tons	67.92
25 tons	70.75
26 tons	73.58
27 tons	76.41
28 tons	79.24
29 tons	82.07
30 tons	84.90
31 tons	87.73
32 tons	90.56
33 tons	93.39
34 tons	96.22
35 tons	99.05
36 tons	101.88
37 tons	104.71
38 tons	107.54
39 tons	110.37
40 tons	113.20
41 tons	116.03
42 tons	118.86
43 tons	121.69
44 tons	124.52
45 tons	127.35
46 tons	130.18
47 tons	133.01
48 tons	135.84
49 tons	138.67
50 tons	141.50
51 tons	144.33
52 tons	147.16
53 tons	149.99
54 tons	152.82
55 tons	155.65
56 tons	158.48
57 tons	161.31
58 tons	164.14
59 tons	166.97
60 tons	169.80
61 tons	172.63
62 tons	175.46
63 tons	178.29
64 tons	181.12
65 tons	183.95
66 tons	186.78
67 tons	189.61
68 tons	192.44
69 tons	195.27
70 tons	198.10
71 tons	200.93
72 tons	203.76
73 tons	206.59
74 tons	209.42
75 tons	212.25
76 tons	215.08
77 tons	217.91
78 tons	220.74
79 tons	223.57
80 tons	226.40
81 tons	229.23
82 tons	232.06
83 tons	234.89
84 tons	237.72
85 tons	240.55
86 tons	243.38
87 tons	246.21
88 tons	249.04
89 tons	251.87
90 tons	254.70
91 tons	257.53
92 tons	260.36
93 tons	263.19
94 tons	266.02
95 tons	268.85

REDUCTION OF TONS TO CUBIC METERS—Continued

	Meters
96 tons	271.68
97 tons	274.51
98 tons	277.34
99 tons	280.17
100 tons	283.00

§ 69.07-7 Reduction of cubic meters to tons.

To reduce cubic meters to tons divide the number of cubic meters in question by 2.83, or multiply it by the factor 0.353.

§ 69.07-9 Table A of common intervals when tonnage depth is 16 feet or less.

Showing in feet the common interval and ⅓ common intervals between tonnage breadths, corresponding to different tonnage depths, when the tonnage depth at the middle of the tonnage length does not exceed 16 feet.

TABLE A

Tonnage depth	Common interval between breadths	⅓ common interval between breadths
2.00	0.500	0.17
2.05	.512	.17
2.10	.525	.18
2.15	.537	.18
2.20	.550	.18
2.25	.562	.19
2.30	.575	.19
2.35	.587	.20
2.40	.600	.20
2.45	.612	.20
2.50	.625	.21
2.55	.637	.21
2.60	.650	.22
2.65	.662	.22
2.70	.675	.23
2.75	.687	.23
2.80	.700	.23
2.85	.712	.24
2.90	.725	.24
2.95	.737	.25
3.00	.750	.25
3.05	.732	.25
3.10	.775	.26
3.15	.787	.26
3.20	.800	.27
3.25	.812	.27
3.30	.825	.28
3.35	.837	.28
3.40	.850	.28
3.45	.862	.29
3.50	.875	.29
3.55	.887	.30
3.60	.900	.30
3.65	.912	.30
3.70	.925	.31
3.75	.937	.31
3.80	.950	.32
3.85	.962	.32
3.90	.975	.33
3.95	.987	.33
4.00	1.000	.33
4.05	1.012	.34
4.10	1.025	.34
4.15	1.037	.35
4.20	1.050	.35
4.25	1.062	.35
4.30	1.075	.36
4.35	1.087	.36
4.40	1.100	.37
4.45	1.112	.37
4.50	1.125	.37
4.55	1.137	.38
4.60	1.150	.38
4.65	1.162	.39
4.70	1.175	.39
4.75	1.187	.40
4.80	1.200	.40
4.85	1.212	.40
4.90	1.225	.41
4.95	1.237	.41
5.00	1.250	.42
5.05	1.262	.42
5.10	1.275	.43
5.15	1.287	.45
5.20	1.300	.45
5.25	1.312	.45
5.30	1.325	.46
5.35	1.337	.43
5.40	1.350	.44
5.45	1.362	.44
5.50	1.375	.43
5.55	1.387	.46
5.60	1.400	.47
5.65	1.412	.47
5.70	1.425	.48
5.75	1.437	.48
5.80	1.450	.48
5.85	1.462	.49
5.90	1.475	.49
5.95	1.487	.50
6.00	1.500	.50
6.05	1.512	.50
6.10	1.525	.51
6.15	1.537	.51
6.20	1.550	.52
6.25	1.562	.52
6.30	1.575	.53
6.35	1.587	.53
6.40	1.600	.53
6.45	1.612	.54
6.50	1.625	.54
6.55	1.637	.55
6.60	1.650	.55
6.65	1.662	.55
6.70	1.675	.56
6.75	1.687	.56

TABLE A—Continued

Tonnage depth	Common interval between breadths	⅓ common interval between breadths
6.80	1.700	.57
6.85	1.712	.57
6.90	1.725	.58
6.95	1.737	.58
7.00	1.750	.58
7.05	1.762	.59
7.10	1.775	.59
7.15	1.787	.60
7.20	1.800	.60
7.25	1.812	.60
7.30	1.825	.61
7.35	1.837	.61
7.40	1.850	.62
7.45	1.862	.62
7.50	1.875	.63
7.55	1.887	.63
7.60	1.900	.63
7.65	1.912	.64
7.70	1.925	.64
7.75	1.937	.65
7.80	1.950	.65
7.85	1.962	.65
7.90	1.975	.66
7.95	1.987	.66
8.00	2.000	.67
8.05	2.012	.67
8.10	2.025	.68
8.15	2.037	.68
8.20	2.050	.68
8.25	2.062	.69
8.30	2.075	.69
8.35	2.087	.70
8.40	2.100	.70
8.45	2.112	.70
8.50	2.125	.71
8.55	2.137	.71
8.60	2.150	.72
8.65	2.162	.72
8.70	2.175	.73
8.75	2.187	.73
8.80	2.200	.73
8.85	2.212	.74
8.90	2.225	.74
8.95	2.237	.75
9.00	2.250	.75
9.05	2.262	.75
9.10	2.275	.76
9.15	2.287	.76
9.20	2.300	.77
9.25	2.312	.77
9.30	2.325	.78
9.35	2.337	.78
9.40	2.350	.78
9.45	2.362	.79
9.50	2.375	.79
9.55	2.387	.80
9.60	2.400	.80
9.65	2.412	.80
9.70	2.425	.81
9.75	2.437	.81
9.80	2.450	.82
9.85	2.462	.82
9.90	2.475	.83
9.95	2.487	.83
10.00	2.500	.83
10.05	2.512	.84
10.10	2.525	.84

TABLE A—Continued

Tonnage depth	Common interval between breadths	⅓ common interval between breadths
10.15	2.537	.85
10.20	2.550	.85
10.25	2.562	.85
10.30	2.575	.86
10.35	2.587	.86
10.40	2.600	.87
10.45	2.612	.87
10.50	2.625	.88
10.55	2.637	.88
10.60	2.650	.88
10.65	2.662	.89
10.70	2.675	.89
10.75	2.687	.90
10.80	2.700	.90
10.85	2.712	.90
10.90	2.725	.91
10.95	2.737	.91
11.00	2.750	.92
11.05	2.762	.92
11.10	2.775	.93
11.15	2.787	.93
11.20	2.800	.93
11.25	2.812	.94
11.30	2.825	.94
11.35	2.837	.95
11.40	2.850	.95
11.45	2.862	.95
11.50	2.875	.96
11.55	2.887	.96
11.60	2.900	.97
11.65	2.912	.97
11.70	2.925	.98
11.75	2.937	.98
11.80	2.950	.98
11.85	2.962	.99
11.90	2.975	.99
11.95	2.987	1.00
12.00	3.000	1.00
12.05	3.012	1.00
12.10	3.025	1.01
12.15	3.037	1.01
12.20	3.050	1.02
12.25	3.062	1.02
12.30	3.075	1.03
12.35	3.087	1.03
12.40	3.100	1.03
12.45	3.112	1.04
12.50	3.125	1.04
12.55	3.137	1.05
12.60	3.150	1.05
12.65	3.162	1.05
12.70	3.175	1.06
12.75	3.187	1.06
12.80	3.200	1.07
12.85	3.212	1.07
12.90	3.225	1.08
12.95	3.237	1.08
13.00	3.250	1.08
13.05	3.262	1.09
13.10	3.275	1.09
13.15	3.287	1.10
13.20	3.300	1.10
13.25	3.312	1.10
13.30	3.325	1.11
13.35	3.337	1.11
13.40	3.350	1.12
13.45	3.362	1.12

TABLE A—Continued

Tonnage depth	Common interval between breadths	⅓ common interval between breadths
13.50	3.375	1.13
13.55	3.387	1.13
13.60	3.400	1.13
13.65	3.412	1.14
13.70	3.425	1.14
13.75	3.437	1.15
13.80	3.450	1.15
13.85	3.462	1.15
13.90	3.475	1.16
13.95	3.487	1.16
14.00	3.500	1.17
14.05	3.512	1.17
14.10	3.525	1.18
14.15	3.537	1.18
14.20	3.550	1.18
14.25	3.562	1.19
14.30	3.575	1.19
14.35	3.587	1.20
14.40	3.600	1.20
14.45	3.612	1.20
14.50	3.625	1.21
14.55	3.637	1.21
14.60	3.650	1.22
14.65	3.662	1.22
14.70	3.675	1.23
14.75	3.687	1.23
14.80	3.700	1.23
14.85	3.712	1.24
14.90	3.725	1.24
14.95	3.737	1.25
15.00	3.750	1.25
15.05	3.762	1.25
15.10	3.775	1.26
15.15	3.787	1.26
15.20	3.800	1.27
15.25	3.812	1.27
15.30	3.825	1.28
15.35	3.837	1.28
15.40	3.850	1.28
15.45	3.862	1.29
15.50	3.875	1.29
15.55	3.887	1.30
15.60	3.900	1.30
15.65	3.912	1.30
15.70	3.925	1.31
15.75	3.937	1.31
15.80	3.950	1.32
15.85	3.962	1.32
15.90	3.975	1.33
15.95	3.987	1.33
16.00	4.000	1.33
16.05	4.012	1.34
16.10	4.025	1.34
16.15	4.037	1.35
16.20	4.050	1.35
16.25	4.062	1.35
16.30	4.075	1.36
16.35	4.087	1.36
16.40	4.100	1.37
16.45	4.112	1.37
16.50	4.125	1.38
16.55	4.137	1.38
16.60	4.150	1.38
16.65	4.162	1.39
16.70	4.175	1.39
16.75	4.187	1.40
16.80	4.200	1.40
16.85	4.212	1.40
16.90	4.225	1.41
16.95	4.237	1.41
17.00	4.250	1.42
17.05	4.262	1.42
17.10	4.275	1.43
17.15	4.287	1.43
17.20	4.300	1.43
17.25	4.312	1.44
17.30	4.325	1.44
17.35	4.337	1.45
17.40	4.350	1.45
17.45	4.362	1.45
17.50	4.375	1.46
17.55	4.387	1.46
17.60	4.400	1.47
17.65	4.412	1.47
17.70	4.425	1.48
17.75	4.437	1.48
17.80	4.450	1.48
17.85	4.462	1.49
17.90	4.475	1.49
17.95	4.487	1.50
18.00	4.500	1.50
18.05	4.512	1.50
18.10	4.525	1.51
18.15	4.537	1.51
18.20	4.550	1.52
18.25	4.562	1.52
18.30	4.575	1.53
18.35	4.587	1.53
18.40	4.600	1.53
18.45	4.612	1.54
18.50	4.625	1.54
18.55	4.637	1.55
18.60	4.650	1.55
18.65	4.662	1.55
18.70	4.675	1.56
18.75	4.687	1.56
18.80	4.700	1.57
18.85	4.712	1.57
18.90	4.725	1.58
18.95	4.737	1.58
19.00	4.750	1.58
19.05	4.762	1.59
19.10	4.775	1.59
19.15	4.787	1.60
19.20	4.800	1.60
19.25	4.812	1.60
19.30	4.825	1.61
19.35	4.837	1.61
19.40	4.850	1.62
19.45	4.862	1.62
19.50	4.875	1.63
19.55	4.887	1.63
19.60	4.900	1.63
19.65	4.912	1.64
19.70	4.925	1.64
19.75	4.937	1.65
19.80	4.950	1.65
19.85	4.962	1.65
19.90	4.975	1.66
19.95	4.987	1.66
20.00	5.000	1.67
20.05	5.012	1.67
20.10	5.025	1.68
20.15	5.037	1.68

TABLE A—Continued

Tonnage depth	Common interval between breadths	⅓ common interval between breadths
20.20	5.050	1.68
20.25	5.062	1.69
20.30	5.075	1.69
20.35	5.087	1.70
20.40	5.100	1.70
20.45	5.112	1.70
20.50	5.125	1.71
20.55	5.137	1.71
20.60	5.150	1.72
20.65	5.162	1.72
20.70	5.175	1.73
20.75	5.187	1.73
20.80	5.200	1.73
20.85	5.212	1.74
20.90	5.225	1.74
20.95	5.237	1.75
21.00	5.250	1.75
21.05	5.262	1.75
21.10	5.275	1.76
21.15	5.287	1.76
21.20	5.300	1.77
21.25	5.312	1.77
21.30	5.325	1.78
21.35	5.337	1.78
21.40	5.350	1.78
21.45	5.362	1.79
21.50	5.375	1.79
21.55	5.387	1.80
21.60	5.400	1.80
21.65	5.412	1.80
21.70	5.425	1.81
21.75	5.437	1.81
21.80	5.450	1.82
21.85	5.462	1.82
21.90	5.475	1.83
21.95	5.487	1.83
22.00	5.500	1.83
22.05	5.512	1.84
22.10	5.525	1.84
22.15	5.537	1.85
22.20	5.550	1.85
22.25	5.562	1.85
22.30	5.575	1.86
22.35	5.587	1.86
22.40	5.600	1.87
22.45	5.612	1.87
22.50	5.625	1.88
22.55	5.637	1.88
22.60	5.650	1.88
22.65	5.662	1.89
22.70	5.675	1.89
22.75	5.687	1.90
22.80	5.700	1.90
22.85	5.712	1.90
22.90	5.725	1.91
22.95	5.737	1.91
23.00	5.750	1.92
23.05	5.762	1.92
23.10	5.775	1.93
23.15	5.787	1.93
23.20	5.800	1.93
23.25	5.812	1.94
23.30	5.825	1.94
23.35	5.837	1.95
23.40	5.850	1.95
23.45	5.862	1.95
23.50	5.875	1.96

TABLE A—Continued

Tonnage depth	Common interval between breadths	⅓ common interval between breadths
23.55	5.887	1.96
23.60	5.900	1.97
23.65	5.912	1.97
23.70	5.925	1.98
23.75	5.937	1.98
23.80	5.950	1.98
23.85	5.962	1.99
23.90	5.975	1.99
23.95	5.987	2.00
24.00	6.000	2.00
24.05	6.012	2.00
24.10	6.025	2.01
24.15	6.037	2.01
24.20	6.050	2.02
24.25	6.062	2.02
24.30	6.075	2.03
24.35	6.087	2.03
24.40	6.100	2.03
24.45	6.112	2.04
24.50	6.125	2.04
24.55	6.137	2.05
24.60	6.150	2.05
24.65	6.162	2.05
24.70	6.175	2.06
24.75	6.187	2.06
24.80	6.200	2.07
24.85	6.212	2.07
24.90	6.225	2.08
24.95	6.237	2.08
25.00	6.250	2.08
25.05	6.262	2.09
25.10	6.275	2.09
25.15	6.287	2.10
25.20	6.300	2.10
25.25	6.312	2.10
25.30	6.325	2.11
25.35	6.337	2.11
25.40	6.350	2.12
25.45	6.362	2.12
25.50	6.375	2.13
25.55	6.387	2.13
25.60	6.400	2.13
25.65	6.412	2.14
25.70	6.425	2.14
25.75	6.437	2.15
25.80	6.450	2.15
25.85	6.462	2.15
25.90	6.475	2.16
25.95	6.487	2.16

§ 69.07-11 Table B of common intervals when tonnage depth exceeds 16 feet.

Showing in feet the common interval and ⅓ common interval between tonnage breadths, corresponding to different tonnage depths, when the tonnage depth at the middle of the tonnage length exceeds 16 feet.

TABLE B

Tonnage depth	Common interval between breadths	⅓ common interval between breadths
14.00	2.333	0.78
14.05	2.341	.78
14.10	2.350	.78
14.15	2.358	.79
14.20	2.366	.79
14.25	2.375	.79
14.30	2.383	.79
14.35	2.391	.80
14.40	2.400	.80
14.45	2.408	.80
14.50	2.416	.81
14.55	2.425	.81
14.60	2.433	.81
14.65	2.441	.81
14.70	2.450	.82
14.75	2.458	.82
14.80	2.466	.82
14.85	2.475	.83
14.90	2.483	.83
14.95	2.491	.83
15.00	2.500	.83
15.05	2.508	.84
15.10	2.516	.84
15.15	2.525	.84
15.20	2.533	.84
15.25	2.541	.85
15.30	2.550	.85
15.35	2.558	.85
15.40	2.566	.86
15.45	2.575	.86
15.50	2.583	.86
15.55	2.591	.86
15.60	2.600	.87
15.65	2.608	.87
15.70	2.616	.87
15.75	2.625	.88
15.80	2.633	.88
15.85	2.641	.88
15.90	2.650	.88
15.95	2.658	.89
16.00	2.666	.89
16.05	2.675	.89
16.10	2.683	.89
16.15	2.691	.90
16.20	2.700	.90
16.25	2.708	.90
16.30	2.716	.91
16.35	2.725	.91
16.40	2.733	.91
16.45	2.741	.91
16.50	2.750	.92
16.55	2.758	.92
16.60	2.766	.92
16.65	2.775	.93
16.70	2.783	.93
16.75	2.791	.93
16.80	2.800	.93
16.85	2.808	.94
16.90	2.816	.94
16.95	2.825	.94
17.00	2.833	.94
17.05	2.841	.95
17.10	2.850	.95
17.15	2.858	.95
17.20	2.866	.96
17.25	2.875	.96
17.30	2.883	.96

TABLE B—Continued

Tonnage depth	Common interval between breadths	⅓ common interval between breadths
17.35	2.891	.96
17.40	2.900	.97
17.45	2.908	.97
17.50	2.916	.97
17.55	2.925	.98
17.60	2.933	.98
17.65	2.941	.98
17.70	2.950	.98
17.75	2.958	.99
17.80	2.966	.99
17.85	2.975	.99
17.90	2.983	.99
17.95	2.991	1.00
18.00	3.000	1.00
18.05	3.008	1.00
18.10	3.016	1.01
18.15	3.025	1.01
18.20	3.033	1.01
18.25	3.041	1.01
18.30	3.050	1.02
18.35	3.058	1.02
18.40	3.066	1.02
18.45	3.075	1.03
18.50	3.083	1.03
18.55	3.091	1.03
18.60	3.100	1.03
18.65	3.108	1.04
18.70	3.116	1.04
18.75	3.125	1.04
18.80	3.133	1.04
18.85	3.141	1.05
18.90	3.150	1.05
18.95	3.158	1.05
19.00	3.166	1.06
19.05	3.175	1.06
19.10	3.183	1.06
19.15	3.191	1.06
19.20	3.200	1.07
19.25	3.208	1.07
19.30	3.216	1.07
19.35	3.225	1.08
19.40	3.233	1.08
19.45	3.241	1.08
19.50	3.250	1.08
19.55	3.258	1.09
19.60	3.266	1.09
19.65	3.275	1.09
19.70	3.283	1.09
19.75	3.291	1.10
19.80	3.300	1.10
19.85	3.308	1.10
19.90	3.316	1.11
19.95	3.325	1.11
20.00	3.333	1.11
20.05	3.341	1.11
20.10	3.350	1.12
20.15	3.358	1.12
20.20	3.366	1.12
20.25	3.375	1.13
20.30	3.383	1.13
20.35	3.391	1.13
20.40	3.400	1.13
20.45	3.408	1.14
20.50	3.416	1.14
20.55	3.425	1.14
20.60	3.433	1.14
20.65	3.441	1.15

TABLE B—Continued

Tonnage depth	Common interval between breadths	⅓ common interval between breadths
20.70	3.450	1.15
20.75	3.458	1.15
20.80	3.466	1.16
20.85	3.475	1.16
20.90	3.483	1.16
20.95	3.491	1.16
21.00	3.500	1.17
21.05	3.508	1.17
21.10	3.516	1.17
21.15	3.525	1.18
21.20	3.533	1.18
21.25	3.541	1.18
21.30	3.550	1.18
21.35	3.558	1.19
21.40	3.566	1.19
21.45	3.575	1.19
21.50	3.583	1.19
21.55	3.591	1.20
21.60	3.600	1.20
21.65	3.608	1.20
21.70	3.616	1.21
21.75	3.625	1.21
21.80	3.633	1.21
21.85	3.641	1.21
21.90	3.650	1.22
21.95	3.658	1.22
22.00	3.666	1.22
22.05	3.675	1.23
22.10	3.683	1.23
22.15	3.691	1.23
22.20	3.700	1.23
22.25	3.708	1.24
22.30	3.716	1.24
22.35	3.725	1.24
22.40	3.733	1.24
22.45	3.741	1.25
22.50	3.750	1.25
22.55	3.758	1.25
22.60	3.766	1.26
22.65	3.775	1.26
22.70	3.783	1.26
22.75	3.791	1.26
22.80	3.800	1.27
22.85	3.808	1.27
22.90	3.816	1.27
22.95	3.825	1.28
23.00	3.833	1.28
23.05	3.841	1.28
23.10	3.850	1.28
23.15	3.858	1.29
23.20	3.866	1.29
23.25	3.875	1.29
23.30	3.883	1.29
23.35	3.891	1.30
23.40	3.900	1.30
23.45	3.908	1.30
23.50	3.916	1.31
23.55	3.925	1.31
23.60	3.933	1.31
23.65	3.941	1.31
23.70	3.950	1.32
23.75	3.958	1.32
23.80	3.966	1.32
23.85	3.975	1.33
23.90	3.983	1.33
23.95	3.991	1.33
24.00	4.000	1.33

TABLE B—Continued

Tonnage depth	Common interval between breadths	⅓ common interval between breadths
24.05	4.008	1.34
24.10	4.016	1.34
24.15	4.025	1.34
24.20	4.033	1.34
24.25	4.041	1.35
24.30	4.050	1.35
24.35	4.058	1.35
24.40	4.066	1.36
24.45	4.075	1.36
24.50	4.083	1.36
24.55	4.091	1.36
24.60	4.100	1.37
24.65	4.108	1.37
24.70	4.116	1.37
24.75	4.125	1.38
24.80	4.133	1.38
24.85	4.141	1.38
24.90	4.150	1.38
24.95	4.158	1.39
25.00	4.166	1.39
25.05	4.175	1.39
25.10	4.183	1.39
25.15	4.191	1.40
25.20	4.200	1.40
25.25	4.208	1.40
25.30	4.216	1.41
25.35	4.225	1.41
25.40	4.233	1.41
25.45	4.241	1.41
25.50	4.250	1.42
25.55	4.258	1.42
25.60	4.266	1.42
25.65	4.275	1.43
25.70	4.283	1.43
25.75	4.291	1.43
25.80	4.300	1.43
25.85	4.308	1.44
25.90	4.316	1.44
25.95	4.325	1.44
26.00	4.333	1.44
26.05	4.341	1.45
26.10	4.350	1.45
26.15	4.358	1.45
26.20	4.366	1.46
26.25	4.375	1.46
26.30	4.383	1.46
26.35	4.391	1.46
26.40	4.400	1.47
26.45	4.408	1.47
26.50	4.416	1.47
26.55	4.425	1.48
26.60	4.433	1.48
26.65	4.441	1.48
26.70	4.450	1.48
26.75	4.458	1.49
26.80	4.466	1.49
26.85	4.475	1.49
26.90	4.483	1.49
26.95	4.491	1.50
27.00	4.500	1.50
27.05	4.508	1.50
27.10	4.516	1.51
27.15	4.525	1.51
27.20	4.533	1.51
27.25	4.541	1.51
27.30	4.550	1.52
27.35	4.558	1.52

TABLE B—Continued

Tonnage depth	Common interval between breadths	⅓ common interval between breadths
27.40	4.566	1.52
27.45	4.575	1.53
27.50	4.583	1.53
27.55	4.591	1.53
27.60	4.600	1.53
27.65	4.608	1.54
27.70	4.616	1.54
27.75	4.625	1.54
27.80	4.633	1.54
27.85	4.641	1.55
27.90	4.650	1.55
27.95	4.658	1.55
28.00	4.666	1.56
28.05	4.675	1.56
28.10	4.683	1.56
28.15	4.691	1.56
28.20	4.700	1.57
28.25	4.708	1.57
28.30	4.716	1.57
28.35	4.725	1.58
28.40	4.733	1.58
28.45	4.741	1.58
28.50	4.750	1.58
28.55	4.758	1.59
28.60	4.766	1.59
28.65	4.775	1.59
28.70	4.783	1.59
28.75	4.791	1.60
28.80	4.800	1.60
28.85	4.808	1.60
28.90	4.816	1.61
28.95	4.825	1.61
29.00	4.833	1.61
29.05	4.841	1.61
29.10	4.850	1.62
29.15	4.858	1.62
29.20	4.866	1.62
29.25	4.875	1.63
29.30	4.883	1.63
29.35	4.891	1.63
29.40	4.900	1.63
29.45	4.908	1.64
29.50	4.916	1.64
29.55	4.925	1.64
29.60	4.933	1.64
29.65	4.941	1.65
29.70	4.950	1.65
29.75	4.958	1.65
29.80	4.966	1.66
29.85	4.975	1.66
29.90	4.983	1.66
29.95	4.991	1.66
30.00	5.000	1.67
30.05	5.008	1.67
30.10	5.016	1.67
30.15	5.025	1.68
30.20	5.033	1.68
30.25	5.041	1.68
30.30	5.050	1.68
30.35	5.058	1.69
30.40	5.066	1.69
30.45	5.075	1.69
30.50	5.083	1.69
30.55	5.091	1.70
30.60	5.100	1.70
30.65	5.108	1.70
30.70	5.116	1.71
30.75	5.125	1.71
30.80	5.133	1.71
30.85	5.141	1.71
30.90	5.150	1.72
30.95	5.158	1.72
31.00	5.166	1.72
31.05	5.175	1.73
31.10	5.183	1.73
31.15	5.191	1.73
31.20	5.200	1.73
31.25	5.208	1.74
31.30	5.216	1.74
31.35	5.225	1.74
31.40	5.233	1.74
31.45	5.241	1.75
31.50	5.250	1.75
31.55	5.258	1.75
31.60	5.266	1.76
31.65	5.275	1.76
31.70	5.283	1.76
31.75	5.291	1.76
31.80	5.300	1.77
31.85	5.308	1.77
31.90	5.316	1.77
31.95	5.325	1.78
32.00	5.333	1.78
32.05	5.341	1.78
32.10	5.350	1.78
32.15	5.358	1.79
32.20	5.366	1.79
32.25	5.375	1.79
32.30	5.383	1.79
32.35	5.391	1.80
32.40	5.400	1.80
32.45	5.408	1.80
32.50	5.416	1.81
32.55	5.425	1.81
32.60	5.433	1.81
32.65	5.441	1.81
32.70	5.450	1.82
32.75	5.458	1.82
32.80	5.466	1.82
32.85	5.475	1.83
32.90	5.483	1.83
32.95	5.491	1.83
33.00	5.500	1.83
33.05	5.508	1.84
33.10	5.516	1.84
33.15	5.525	1.84
33.20	5.533	1.84
33.25	5.541	1.85
33.30	5.550	1.85
33.35	5.558	1.85
33.40	5.566	1.86
33.45	5.575	1.86
33.50	5.583	1.86
33.55	5.591	1.86
33.60	5.600	1.87
33.65	5.608	1.87
33.70	5.616	1.87
33.75	5.625	1.88
33.80	5.633	1.88
33.85	5.641	1.88
33.90	5.650	1.88
33.95	5.658	1.89
34.00	5.666	1.89
34.05	5.675	1.89

TABLE B—Continued

Tonnage depth	Common interval between breadths	⅓ common interval between breadths
34.10	5.683	1.89
34.15	5.691	1.90
34.20	5.700	1.90
34.25	5.708	1.90
34.30	5.716	1.91
34.35	5.725	1.91
34.40	[illegible]	1.91
34.45	5.741	1.91
34.50	5.750	1.92
34.55	5.758	1.92
34.60	5.766	1.92
34.65	5.775	1.93
34.70	5.783	1.93
34.75	5.791	1.93
34.80	5.800	1.93
34.85	5.808	1.94
34.90	5.816	1.94
34.95	5.825	1.94
35.00	5.833	1.94
35.05	5.841	1.95
35.10	5.850	1.95
35.15	5.858	1.95
35.20	5.866	1.96
35.25	5.875	1.96
35.30	5.883	1.96
35.35	5.891	1.96
35.40	5.900	1.97
35.45	5.908	1.97
35.50	5.916	1.97
35.55	5.925	1.98
35.60	5.933	1.98
35.65	5.941	1.98
35.70	5.950	1.98
35.75	5.958	1.99
35.80	5.966	1.99
35.85	5.975	1.99
35.90	5.983	1.99
35.95	5.991	2.00
36.00	6.000	2.00
36.05	6.008	2.00
36.10	6.016	2.01
36.15	6.025	2.01
36.20	6.033	2.01
36.25	6.041	2.01
36.30	6.050	2.02
36.35	6.058	2.02
36.40	6.066	2.02
36.45	6.075	2.03
36.50	6.083	2.03
36.55	6.091	2.03
36.60	6.100	2.03
36.65	6.108	2.04
36.70	6.116	2.04
36.75	6.125	2.04
36.80	6.133	2.04
36.85	6.141	2.05
36.90	6.150	2.05
36.95	6.158	2.05
37.00	6.166	2.06
37.05	6.175	2.06
37.10	6.183	2.06
37.15	6.191	2.06
37.20	6.200	2.07
37.25	6.208	2.07
37.30	6.216	2.07
37.35	6.225	2.08
37.40	6.233	2.08

TABLE B—Continued

Tonnage depth	Common interval between breadths	⅓ common interval between breadths
37.45	6.241	2.08
37.50	6.250	2.08
37.55	6.258	2.09
37.60	6.266	2.09
37.65	6.275	2.09
37.70	6.283	2.09
37.75	6.291	2.10
37.80	6.300	2.10
37.85	6.308	2.10
37.90	6.316	2.11
37.95	6.325	2.11
38.00	6.333	2.11
38.05	6.341	2.11
38.10	6.350	2.12
38.15	6.358	2.12
38.20	6.366	2.12
38.25	6.375	2.13
38.30	6.383	2.13
38.35	6.391	2.13
38.40	6.400	[illegible]
38.45	6.408	2.14
38.50	6.416	2.14
38.55	6.425	2.14
38.60	6.433	2.14
38.65	6.441	2.15
38.70	6.450	2.15
38.75	6.458	2.15
38.80	6.466	2.16
38.85	6.475	2.16
38.90	6.483	2.16
38.95	6.491	2.16
39.00	6.500	2.17
39.05	6.508	2.17
39.10	6.516	2.17
39.15	6.525	2.18
39.20	6.533	2.18
39.25	6.541	2.18
39.30	6.550	2.18
39.35	6.558	2.19
39.40	6.566	2.19
39.45	6.575	2.19
39.50	6.583	2.19
39.55	6.591	2.20
39.60	6.600	2.20
39.65	6.608	2.20
39.70	6.616	2.21
39.75	6.625	2.21
39.80	6.633	2.21
39.85	6.641	2.21
39.90	6.650	2.22
39.95	6.658	2.22
40.00	6.666	2.22
40.05	6.675	2.23
40.10	6.683	2.23
40.15	6.691	2.23
40.20	6.700	2.23
40.25	6.708	2.24
40.30	6.716	2.24
40.35	6.725	2.24
40.40	6.733	2.24
40.45	6.741	2.25
40.50	6.750	2.25
40.55	6.758	2.25
40.60	6.766	2.26
40.65	6.775	2.26
40.70	6.783	2.26
40.75	6.791	2.27

TABLE B—Continued

Tonnage depth	Common interval between breadths	⅓ common interval between breadths
40.80	6.800	2.27
40.85	6.808	2.27
40.90	6.816	2.27
40.95	6.825	2.28
41.00	6.833	2.28
41.05	6.841	2.28
41.10	6.850	2.28
41.15	6.858	2.29
41.20	6.866	2.29
41.25	6.875	2.29
41.30	6.883	2.29
41.35	6.891	2.30
41.40	6.900	2.30
41.45	6.908	2.30
41.50	6.916	2.31
41.55	6.925	2.31
41.60	6.933	2.31
41.65	6.941	2.31
41.70	6.950	2.32
41.75	6.958	2.32
41.80	6.966	2.32
41.85	6.975	2.33
41.90	6.983	2.33
41.95	6.991	2.33
42.00	7.000	2.33
42.05	7.008	2.34
42.10	7.016	2.34
42.15	7.025	2.34
42.20	7.033	2.34
42.25	7.041	2.35
42.30	7.050	2.35
42.35	7.058	2.35
42.40	7.066	2.36
42.45	7.075	2.36
42.50	7.083	2.36
42.55	7.091	2.36
42.60	7.100	2.37
42.65	7.108	2.37
42.70	7.116	2.37
42.75	7.125	2.38
42.80	7.133	2.38
42.85	7.141	2.38
42.90	7.150	2.38
42.95	7.158	2.39
43.00	7.166	2.39
43.05	7.175	2.39
43.10	7.183	2.39
43.15	7.191	2.40
43.20	7.200	2.40
43.25	7.208	2.40
43.30	7.216	2.41
43.35	7.225	2.41
43.40	7.233	2.41
43.45	7.241	2.41
43.50	7.250	2.42
43.55	7.258	2.42
43.60	7.266	2.42
43.65	7.275	2.43
43.70	7.283	2.43
43.75	7.291	2.43
43.80	7.300	2.43
43.85	7.308	2.44
43.90	7.316	2.44
43.95	7.325	2.44
44.00	7.333	2.44
44.05	7.341	2.45
44.10	7.350	2.45
44.15	7.358	2.45
44.20	7.366	2.46
44.25	7.375	2.46
44.30	7.383	2.46
44.35	7.391	2.46
44.40	7.400	2.47
44.45	7.408	2.47
44.50	7.416	2.47
44.55	7.425	2.48
44.60	7.433	2.48
44.65	7.441	2.48
44.70	7.450	2.48
44.75	7.458	2.49
44.80	7.466	2.49
44.85	7.475	2.49
44.90	7.483	2.49
44.95	7.491	2.50
45.00	7.500	2.50
45.05	7.508	2.50
45.10	7.516	2.51
45.15	7.525	2.51
45.20	7.533	2.51
45.25	7.541	2.51
45.30	7.550	2.52
45.35	7.558	2.52
45.40	7.566	2.52
45.45	7.575	2.53
45.50	7.583	2.53
45.55	7.591	2.53
45.60	7.600	2.53
45.65	7.608	2.54
45.70	7.616	2.54
45.75	7.625	2.54
45.80	7.633	2.54
45.85	7.641	2.55
45.90	7.650	2.55
45.95	7.658	2.55

Subpart 69.09—Definitions of Enclosures on or Above the Upper Deck

§ 69.09-1 Break.

A break is the space above the line of the under side of the upper deck when that deck is cut off and continued at a higher elevation. The height of a break is the distance from the said line to the under side of the break deck.

§ 69.09-3 Bridge.

A decked erection usually from 6 to 8 feet in height and of undefined length, fitted about amidships and extending from side to side over the upper deck of a vessel.

§ 69.09-5 Chart house.

A house, room or space designated for the purpose of navigation in connection with the stowage and use of charts and navigating instruments necessary to the plotting of the course of the vessel.

§ 69.09-7 Deck house.

(Formerly called roundhouse.) An erection on or above the upper deck but not extending from side to side of the vessel, as is the case with a bridge, a forecastle, a poop, or raised quarterdeck. For descriptive purposes on vessel documents, spaces not extending from side to side of the vessel, such as cabin trunks, and closed-in spaces over the holds of motorboats, etc., may be classed as deck houses.

§ 69.09-9 Excess hatchways.

The difference between one-half of 1 percent of the gross tonnage exclusive of hatchways and the aggregate tonnage of the hatchways.

§ 69.09-11 Forecastle.

A structure on and located at the extreme forward end of the upper deck and having its sides completely enclosed by a continuation upward of the vessel's outer skin.

§ 69.09-13 Light and air spaces.

The portion of the spaces within the casings around the boiler and engine hatches and above the upper deck to the hull of a vessel when used for admission of light and air to the boilers or machinery below.

§ 69.09-15 Poop.

A structure on and located at the extreme after end of the upper deck and having its sides completely enclosed by a continuation upward of the vessel's outer skin.

§ 69.09-17 Radio house or space.

A structure or space in which the radio apparatus is installed and which may or may not provide accommodations for the operator or operators when off duty.

§ 69.09-19 Side house.

A small house at the side of the upper, forecastle, bridge, or poop deck, etc., of a vessel.

§ 69.09-21 Superstructure.

Any superstructure the breadth of which (at all points throughout its length) is approximately equivalent to the breadth of the upper deck, and the side frames of which are entirely independent of the main frames of the vessel. This definition is not applicable to forecastle, bridge, or poop.

Subpart 69.11—Definitions of Items of Deduction

§ 69.11-1 Anchor gear.

The space below deck occupied by chains or cables, machinery, etc., for handling the anchor.

§ 69.11-3 Boatswain's stores.

The spaces for storing paints, oils, blocks, hawsers, rigging, deck gear, etc., in charge of the boatswain and for daily use on the vessel.

§ 69.11-5 Chart house.

(See definition in § 69.09-5.)

§ 69.11-7 Crew spaces.

The space appropriated exclusively to the use of the crew of a vessel, except such spaces as the engineer's workship, carpenter shop, plumber shop, butcher shop, etc., wherever situated. The total of all crew space deductions will be shown on vessel's documents under the head of "Crew space."

§ 69.11-9 Master's cabin.

A space for the exclusive use of the master, consisting of sleeping room, bathroom, dressing room, office, and passageways serving his accommodations.

§ 69.11-11 Radio house.

(See definition in § 69.09-17.)

§ 69.11-13 Steering gear.

The space below deck occupied by machinery, fittings, etc., for operating the steering gear.

§ 69.11-15 Storage of sails.

The space in a vessel propelled wholly by sails used excusively for storing the same, subject to the limitation of 2½ percent of the vessel's gross tonnage.

Subpart 69.13—Definitions of Structural Terms, Etc.

§ 69.13-1 After perpendicular.

A vertical straight line at the after edge of the rudder post.

§ 69.13-3 Athwart; athwartship.

In a transverse direction; from side to side at right angles to the fore and aft center line of a vessel.

§ 69.13-5 Batten.

A board several inches in breadth, usually fitted on the side frames in holds and between decks of vessels instead of ceiling.

§ 69.13-7 Beam.

An athwart member supporting a portion of a deck. Also the breadth of the vessel.

§ 69.13-9 Between decks.

For measurement purposes it is the space between the second and third, and third and fourth decks, etc., the decks being numbered from below.

§ 69.13-11 Body plan.

A drawing consisting of a pair of half transverse elevations or end views of a vessel, both having a common vertical middle line, so that the right-hand side represents the vessel as seen from ahead and the left-hand side as seen from astern. On the body plan appear the forms of the various cross sections. The curvature of the rail and deck lines at the sides, and with the water lines, buttock lines, and diagonal lines indicated as straight lines.

§ 69.13-13 Booby hatch.

A small companion fitted with a sliding top.

§ 69.13-15 Break in double bottom.

The point where the line of the inner bottom is broken by being either raised or lowered from the normal line of same.

§ 69.13-17 Bulkhead.

Bulkheads are partitions by which compartments, etc., are formed, or the hold of a vessel is divided.

§ 69.13-19 Bulwark.

A term applied to the strake of shell plating or the side planking above the weather deck and usually extends between the forecastle and the bridge or the bridge and the poop.

§ 69.13-21 Ceiling.

The covering of wood planking on the inboard face of a vessel's side frames, bottom frames, floor timbers, and sometimes on the under side of deck beams.

§ 69.13-23 Cellular double bottom.

A term applied when the double bottom is divided into numerous compartments by the floors and longitudinals.

§ 69.13-25 Coaming.

The vertical boundary around a hatch, skylight, etc., the "sill" below a tonnage opening in a bulkhead.

§ 69.13-27 Cockpit.

A space at the bottom of which is a platform sunk below the line of the upper deck on small craft.

§ 69.13-29 Companion.

A small structure sheltering a deck opening affording entrance to a companionway.

§ 69.13-31 Companionway.

A stairway or ladderway leading to a space above or below.

§ 69.13-33 Covering board.

A plank or a strake of planking fitted horizontally on top of frame heads at the line of weather deck.

§ 69.13-35 Crown.

A term sometimes used to denote the round up or camber of a deck.

§ 69.13-37 Deck hook.

A wooden hook or knee on the level of deck beams on which the extreme forward ends of deck planks rest and to which they are fastened. On iron or steel vessels, a plate connecting the extreme ends of deck stringer plates.

§ 69.13-39 Depth of frame.

The depth of a bottom frame is its perpendicular height. (See d, Figure 1 (§ 69.07-1).) The depth of a side frame is the athwart distance between its inboard and outboard face.

§ 69.13-41 Double bottom.

Compartments at bottom of ship between inner and outer bottom plating, used for ballast tanks, water, fuel oil, etc.

§ 69.13-43 Fidley hatch.

Hatch around smokestack and uptake.

§ 69.13-45 Flange.

Portion of a plate or shape at, or nearly at right angles to main portion.

§ 69.13-47 Flare.

A spreading outward and upward.

§ 69.13-49 Floor or floor timber.

The lowermost piece of timber connecting the main frames, notched to fit over the keel or keelson and extending the full depth of the frames to which it is fastened. In an iron or steel vessel a plate placed vertically in the bottom, extending from bilge to bilge, in way of each frame, to which it (the frame) is connected. In double bottoms of the usual construction it extends from the outer to the inner bottom thereof.

§ 69.13-51 Frame.

One of the numerous transverse (longitudinal in Isherwood-type vessels) "ribs" that form the framing of a vessel.

§ 69.13-53 Frame bracket.

A plate connecting a side frame to the margin plate.

§ 69.13-55 Freeing port.

An opening in the bulwark or shell plating between the shelter and upper decks for discharging large quantities of water which may be shipped.

§ 69.13-57 General arrangement plans.

Plans showing the various quarters, spaces and compartments into which a vessel is usually divided.

§ 69.13-59 Gudgeon.

Fittings on the sternpost to take the rudder pintles.

§ 69.13-61 Gunwale.

A term applied to the line where an upper deck stringer intersects the shell.

§ 69.13-63 Hatchway.

An aperture in a vessel's deck through which cargo is laden or discharged; in common practice the term "hatch" is also applied.

§ 69.13-65 Hold.

For admeasurement purposes, that portion of the vessel below the tonnage deck.

§ 69.13-67 Horn timber.

The center line frame in the stern of a wooden vessel, extending aft from the sternpost.

§ 69.13-69 Inboard profile.

Drawing of a vessel cut vertically through its longitudinal center line, showing its forward and after perpendiculars, line of deck at center and side, height of decks, tanks, height of bottom frames or floors and their spacing, assignment of various spaces, machinery, etc.

§ 69.13-71 Inner bottom.

Plating forming the upper boundary of the double bottom. Also called the tank top.

§ 69.13-73 Keel.

In wooden and composite vessels it is composed of pieces of timber and extends from stem to sternpost and is the bottom member of the vessel's structure. In iron or steel vessels it consists of long bars fitted vertically or of plates fitted horizontally at the middle line.

§ 69.13-75 Keelson.

In wooden vessels the keelson is composed (like the keel) of various pieces of timber placed on the bottom frames directly over and in line with the keel and extending all fore and aft. In iron or steel vessels the middle-line keelson is the keelson at the centerline, directly over the keel.

§ 69.13-77 Length between perpendiculars.

The length of a vessel measured from the forward edge of the stem where it intersects the load water line to the after perpendicular.

§ 69.13-79 Length overall.

The length of a vessel measured from the foremost part of the stem to the aftermost point of the stern.

§ 69.13-81 Limber strake.

The fore and aft plank of bottom ceiling laid next to the keelson.

§ 69.13-83 Longitudinal framing.

A system of construction in which, in conjunction with deep web frames, the main frames are run fore and aft instead of athwartships.

§ 69.13-85 Longitudinal.

A fore and aft vertical member running parallel, or nearly parallel, to the center vertical keel through the double bottom.

§ 69.13-87 Main rail.

Rail fitted on the upper edge of bulwark plating, or upon the stanchions surrounding an upper deck.

§ 69.13-89 Margin plate.

The outer boundary of the inner bottom, connecting it to the shell plating at the bilge.

§ 69.13-91 Midship cross section.

A drawing of a vessel cut athwartship at about mid-length, showing moulded depth, moulded breadth, round or pitch of beam, depth of side and bottom frames, floors, etc.

§ 69.13-93 Orlop deck.

The lowest partial deck.

§ 69.13-95 Outboard.

Away from the center line, toward the side of the vessel.

§ 69.13-97 Pintle.

Fitting or pin on the rudder which turns in a gudgeon.

§ 69.13-99 Planking.

A term applied to wood decks and to the outside planking of wood or composite vessels.

§ 69.13-101 Plating.

The plates of the shell, decks, bulkheads, etc.

§ 69.13-103 Quadrant.

A casting, forging or built-up frame in the shape of a sector of a circle attached to the rudder stock and through which the steering gear leads turn the rudder.

§ 69.13-105 Rabbet.

A groove or channel cut in a piece of timber to take the edge of a plank, or the ends of a number of planks.

§ 69.13-107 Rake of the bow.

The inclination of the line of the stem from the forward perpendicular.

§ 69.13-109 Rake of the stern timber.

Its (stern timber) inclination from the after perpendicular.

§ 69.13-111 Reverse frame.

An angle bar or other shape riveted to the top of floors and/or the inner edge of a transverse frame to reinforce it.

§ 69.13-113 Rudder post.

See sternpost.

§ 69.13-115 Rudder stock.

The main piece of the rudder frame, to which the pintles are connected and to the upper end of which the quadrant or tiller is fitted.

§ 69.13-117 Samson post.

A heavy vertical post that supports cargo booms.

§ 69.13-119 Scantlings.

Dimensions of various members that are used in the construction of a vessel.

§ 69.13-121 Scupper.

A round or oval aperture usually fitted in decks for the purpose of drainage.

§ 69.13-123 Settling tanks.

Oil tanks used for separating entrained water from the oil. The oil is allowed to stand for a time, to permit the water to settle at the bottom when it is drained or pumped off.

§ 69.13-125 Shaft tunnel.

Enclosed alley-way around propeller shaft.

§ 69.13-127 Shelf.

A fore and aft timber fitted to the frames and forming a support for the ends of the deck beams.

§ 69.13-129 Shell plating.

The plates forming the outer skin of the hull.

§ 69.13-131 Sheer.

The amount by which the height of the weather deck at the forward and after perpendiculars exceeds this height at the mid-perpendicular.

§ 69.13-133 Skin.

A term usually applied to the outside planking or plating.

§ 69.13-135 Skylight.

A built-up frame of wood or metal having glass lights fitted in the top and installed over a deck opening for the purpose of furnishing light and air to the spaces below.

§ 69.13-137 Stem.

In the case of wooden vessels, it is the heavy piece of timber at which the outside planking terminates at the forward end of the hull. In iron or steel vessels it is the heavy piece of iron or steel extending from the keel to above the uppermost weather deck, and forming the extreme fore end of a vessel.

§ 69.13-139 Stern.

The after end of a vessel.

§ 69.13-141 Sternpost (main).

In wooden vessels, the piece of timber extending from the after end of the keel to the uppermost deck and to which the rudder braces are fixed to receive the pintles by which the rudder is hung. In iron or steel sailing vessels, paddle and twin-screw steamers, the heavy forging or casting of iron or steel extending from the after end of the keel (to which it is scarfed) to an appropriate distance within the hull; in single screw steamers, the after part of the stern frame.

§ 69.13-143 Stiffener.

An angle bar, T-bar, channel bar, etc., used to stiffen plating of the bulkhead, etc.

§ 69.13-145 Strake.

A fore and aft continuous course or row of shell or other plating or planking.

§ 69.13-147 Tank top.

Plating forming the top of a double bottom. The inner bottom.

§ 69.13-149 Transom.

A floor plate extending across the vessel at the forward side of the sternpost and attached thereto.

§ 69.13-151 Transverse framing.

Athwartship and vertical members forming the vessel's framing. Opposite to the longitudinal system of framing.

§ 69.13-153 Tumble home.

An inboard sloping of the vessel's side. (The opposite to flare.)

§ 69.13-155 Web frame.

Members built of plates and angles, spaced at required intervals, and fitted in lieu of main frames for the purpose of local strengthening.

§ 69.13-157 Wheelhouse (or pilot house).

The house in which a steering wheel is located for the steering and navigation of the vessel.

Subpart 69.15—Optional Dual-Tonnage Method for Measurement of Vessels

§ 69.15-1 Definitions of terms used in this subpart.

(a) *Uppermost complete deck.* The term "uppermost complete deck" means the uppermost complete deck of a vessel exposed to sea and weather, which shall be deemed to be that deck which has permanent means of closing all openings in the weather portions thereof: *Provided,* That any opening in the side of the vessel below that deck, other than an opening abaft a transverse watertight bulkhead placed aft of the rudder stock, is fitted with permanent means of a watertight closing.

(b) *Second deck.* The term "second deck" means the deck next below the uppermost complete deck which is continuous in a fore-and-aft direction at least between peak bulkheads, is continuous athwartships, is fitted as an integral and permanent part of the vessel's structure, and has proper covers to all main hatchways. Interruptions in way of propelling machinery space openings, ladder and stairway openings, trunks, chain lockers, cofferdams, or steps not exceeding a total height of 48 inches shall not be deemed to break the continuity of the deck.

(c) *Trunks.* The term "trunks" as used in the definition of second deck shall be deemed to refer to hatch or ventilation trunks which do not extend longitudinally completely between main transverse bulkheads.

(d) *Tonnage deck.* The "tonnage deck" is the "uppermost complete deck" of a single deck vessel and the "second deck" of a vessel having more than one complete deck.

§ 69.15-3 Additional closed-in spaces omitted from gross tonnage.

Upon application by the owner filed with and approved by the Officer in Charge of the marine inspection zone where the vessel is located, a vessel whether or not it has been previously measured shall be measured with the following closed-in spaces omitted from inclusion in the gross tonnage in addition to those spaces omitted under the provisions of §§ 69.03-63 and 69.03-65.

(a) Spaces on or above the uppermost complete deck available for carrying dry cargo and stores,

(b) Cabins and staterooms on the uppermost complete deck assigned for the use of passengers only when a tonnage mark placed and displayed on each side of the vessel under the provisions of §§ 69.15-19, 69.15-21, and 69.15-23 is not submerged,

(c) Spaces between the uppermost complete deck and the second deck available for carrying dry cargo and stores when the tonnage mark is not submerged, and

(d) Spaces between the uppermost complete deck and the second deck which would be omitted under the provisions of § 69.03-63 if on the uppermost complete deck but only when the tonnage mark is not submerged.

§ 69.15-5 Regulations applicable to vessels measured under the optional dual-tonnage method.

Except as provided for in this subpart, a vessel measured under the provisions of the optional dual-tonnage method is subject to the same requirements as any other vessel which is measured under the pertinent provisions of this part.

§ 69.15-7 Capacity under tonnage deck.

(a) The capacity under the tonnage deck shall be the cubic capacity below the actual tonnage deck less water-ballast spaces which are exemptible under the provisions of § 69.03-63.

(b) If the tonnage deck has one or more steps (breaks), the capacity under tonnage deck shall consist of:

(1) The cubic capacity of the space below the line of the lowest level of the tonnage deck; and

(2) The cubic capacity of spaces lying between that line and the actual tonnage deck.

(c) The tonnage length shall be measured as provided by § 69.03-31.

§ 69.15–9 Capacity between decks.

(a) The space between the actual tonnage deck and the actual uppermost complete deck shall be measured and included in the gross tonnage subject to the omissions provided by §§ 69.03–63 and 69.15–3 (c) and (d).

(b) If there are one or more steps in the tonnage deck or the uppermost complete deck or both, subject to the omissions provided by §§ 69.03–63 and 69.15–3 (c) and (d), the capacity between decks shall be the cubic capacity of the space between the line of the lowest level of the tonnage deck and the line of the lowest level of the uppermost complete deck plus the capacity of the space between the line of the lowest level of the uppermost complete deck and the actual uppermost complete deck minus the capacity of the space above the line of the lowest level of the tonnage deck which was included in the capacity under tonnage deck.

§ 69.15–11 Capacity of deck structures.

Deck structures of permanent nature situated on or above the uppermost complete deck shall be measured and included in the gross tonnage subject to the omissions provided by §§ 69.03–63, 69.03–65, and 69.15–3 (a) and (b).

§ 69.15–13 Hatchways.

The excess tonnage of hatchways over cargo spaces which are included in the gross tonnage shall be determined in accordance with the provisions of § 69.03–59.

§ 69.15–15 Register tonnages.

(a) The gross tonnage referred to in this subpart is the gross register tonnage which is the sum of the following capacities:

(1) The capacity under tonnage deck as obtained under the provisions of § 69.15–7;

(2) The capacity between decks as obtained under the provisions of § 69.15–9;

(3) The capacity of deck structures as obtained under the provisions of § 69.15–11;

(4) The excess tonnage of hatchways as provided by § 69.15–13; and

(5) Light and air space added to the propelling machinery space under the provisions of § 69.03–95.

(b) The net tonnage referred to in §§ 69.15–17 through 69.15–41 is the net register tonnage which is the tonnage remaining after the authorized deductions have been made from the gross register tonnage.

§ 69.15–17 Single-tonnage and dual-tonnage assignments for vessels measured under the provisions of the optional dual-tonnage method.

(a) A single deck vessel shall be assigned only one gross tonnage and one net tonnage.

(b) A vessel having two or more complete decks may be assigned dual gross and net tonnages as follows:

(1) A higher gross tonnage applicable when the tonnage mark provided by § 69.15–19 is submerged;

(2) A higher net tonnage related to the higher gross tonnage;

(3) A lower gross tonnage applicable when the tonnage mark is not submerged; and

(4) A lower net tonnage related to the lower gross tonnage.

(c) A vessel having two or more complete decks may be assigned one gross tonnage and one net tonnage corresponding to the lower gross and net tonnages if the tonnage mark is placed at the level of the assigned load line mark in accordance with the provisions of § 69.15–23(b).

[CGFR 69-138, 34 FR 20131, Dec. 23, 1969; 35 FR 1104, Jan. 28, 1970]

§ 69.15–19 The tonnage mark and form of identification.

(a) The tonnage mark referred to in § 69.15–3 (b), (c), and (d) shall consist of a horizontal line 15 inches long and 1 inch wide. On the tonnage mark shall be placed for identification purposes an inverted equilateral triangle, each side 12 inches long and 1 inch wide, with its apex on the midpoint of the line. (See figure 54.)

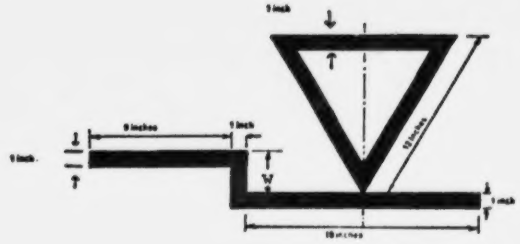


FIGURE 54.—Form and dimensions of tonnage mark (§ 2.89).

w = Allowance for fresh water and tropical waters; 1/48 of the molded draft to the tonnage mark.

(b) An additional line for fresh water and tropical waters may be assigned at a level higher than the tonnage mark.

(1) The allowance to be used in fixing the additional line for fresh water and tropical waters shall be one forty-eighth of the molded draft to the tonnage mark.

(2) The additional line for fresh water and tropical waters shall be a horizontal line 9 inches long and 1 inch wide, measured from a vertical line, the latter 1 inch being marked at the after end of, and perpendicular to the tonnage mark.

(c) The upper edge of the tonnage mark and of the additional line for fresh water and tropical waters shall be designated by a welding bead or other similarly permanent means.

(d) The tonnage mark, the additional line for fresh water and tropical waters, the vertical line, and the triangle shall be maintained in a light color on a dark background or a dark color on a light background.

(e) The tonnage mark shall be deemed to be submerged at a salt water or brackish water port when the upper edge of the tonnage mark is submerged.

(f) The tonnage mark shall be deemed to be submerged at a fresh water port (one at which 100 percent of the fresh water allowance for load lines is permitted under tables published by the Coast Guard) when the upper edge of the additional line for fresh water and tropical waters is submerged.

§ 69.15-21 Longitudinal location of the tonnage mark.

The tonnage mark shall be placed on each side of the ship abaft amidships but as near thereto as practicable. In no case shall the apex of the triangle on the tonnage mark be less than 21 inches nor more than 6 feet 6 inches abaft the vertical centerline of the loadline disk. (See k in figures 55 and 56 (§ 69.15-23(b)).)

§ 69.15-23 Vertical location of the tonnage mark.

(a) The upper edge of the tonnage mark shall be at a distance below the molded line of the second deck determined according to the table in § 69.15-31. (See Figure 55 (paragraph (b) of this section).)

(b) When the loadline assigning authority certifies that the loadline is fixed at a place determined as though the second deck were the freeboard deck, the tonnage mark may be placed below that deck less than the minimum distance derived from the tonnage mark table. In that case the tonnage mark shall be placed on the level of the uppermost part of the loadline grid. If the tonnage mark is so placed, the additional line for fresh water and tropical waters provided by § 69.15-19(b) shall not be used. (See Figure 56.)

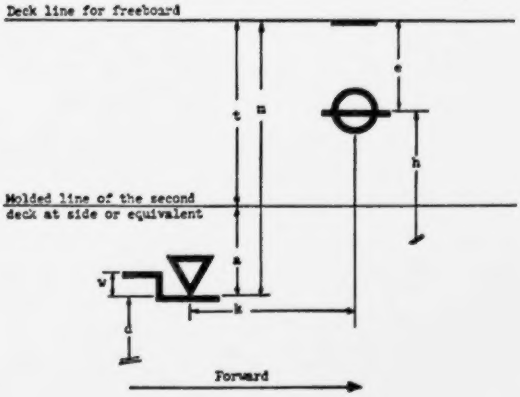


FIGURE 55.—Tonnage mark location for a case in which the loadline is *not* fixed at a place determined as though the second deck were the freeboard deck.

a = Distance from molded line of second deck to upper edge of tonnage mark.
d = Molded draft to upper edge of tonnage mark.
e = Freeboard from loadline certificate.
h = Molded draft to loadline.
k = Distance from centerline of loadline disk to apex of triangle on tonnage mark.
m = Distance from deck line to tonnage mark.
t = Distance from molded line of second deck to deck line for freeboard.
w = Allowance for fresh water and tropical waters (d/48).

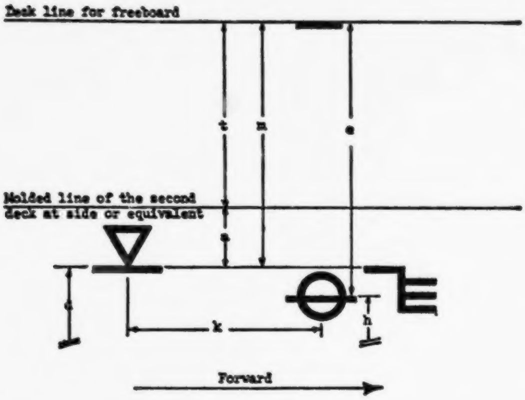


FIGURE 56.—Tonnage mark location for a case in which the loadline *is* fixed at a place determined as though the second deck were the freeboard deck.

a = Distance from molded line of second deck to upper edge of tonnage mark.
d = Molded draft to upper edge of tonnage mark.
e = Freeboard from loadline certificate.
h = Molded draft to loadline.
k = Distance from centerline of loadline disk to apex of triangle on tonnage mark.
m = Distance from deck line to tonnage mark.
t = Distance from molded line of second deck to deck line for freeboard.

§ 69.15-25 Depth (D_s) used with the tonnage mark table.

(a) The depth (D_s) to be used with the tonnage mark table in § 69.15-31 shall be the molded depth to the second deck.

(b) If the second deck is stepped, an equivalent depth shall be used. (See Figure 57 (§ 69.15-29(c)).)

(1) If the higher portion of the deck is less than one-half the total length (L) of both portions, the depth for the table (D_s) shall be the molded depth amidships (D) increased by the ratio of the length of the shorter portion (I) to the total length (L) times the height of the step (b).

($D_s = D + [I/L]b$ in the upper example in fig. 57)

(2) If the lower portion of the deck is less than one-half the total length (L) of both portions, the depth for the table (D_s) shall be the molded depth amidships (D) decreased by the ratio of the length of the shorter portion (I) to the total length (L) times the height of the step (b).

($D_s = D - [I/L]b$ in the lower example in fig. 57)

§ 69.15-27 Length (L_t) used in the tonnage mark table.

(a) The length (L_t) as used in the tonnage mark table shall be the distance on the second deck between two points, of which the foremost is the point where the underside of that deck or the line thereof at the stem, meets the inner surface of the ceiling, sparring or frames, and the aftermost is the point where the underside of that deck, or the line thereof, meets the inner surface of the ceiling, sparring or frames in the middle plane at the stern.

(b) If the second deck is stepped, an equivalent length (L_t) shall be measured along an equivalent of the molded line parallel to the second deck and passing through the upper terminal of the depth (D_s). (See Figure 57 (§ 69.15-29(c)).

§ 69.15-29 Figures in the tonnage mark table.

(a) The figures in the tonnage mark table in § 69.15-31 show the minimum distance from the molded line of the second deck or, if the deck is stepped, from the equivalent of the molded line as set out in § 69.15-27(b), to the upper edge of the tonnage mark.

(b) The tonnage mark table is given for the whole number ratios L_t/D_s from 12 to 20, where D_s and L_t are the depth and length as set out in §§ 69.15-25 and 69.15-27 and for lengths up to 800 feet at intervals of 10 feet.

(c) For intermediate lengths and L_t/D_e ratios, the corresponding distances shall be obtained by linear interpolation. For other cases the distances shall be obtained by extrapolation.

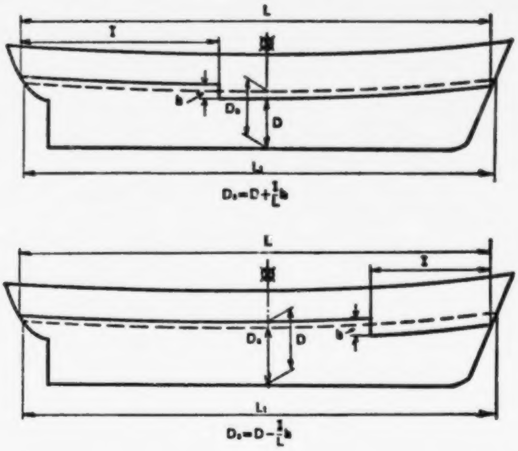


FIGURE 57.—Equivalent depths and lengths in cases of stepped decks (sections 2.92 and 2.93).

b=Height of step in deck.
D=Molded depth from second deck at the side amidships.
D_e=Equivalent depth used with the tonnage mark table.
L=Total length of portions of stepped deck.
L_t=Equivalent length used with tonnage mark table.
I=Length of shorter portion of stepped deck.

§ 69.15-31 Tonnage mark table.

(a) Minimum distance from the molded line of the second deck to the upper edge of the tonnage mark.

(b) Examples of use of tonnage mark table.

L_t/D_e	12	13	14	15	16	17	18	19	20
Length L_t in feet:									
220 and under	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
230	3.2	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
240	4.7	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
250	6.3	3.3	2.0	2.0	2.0	2.0	2.0	2.0	2.0
260	8.0	4.8	2.1	2.0	2.0	2.0	2.0	2.0	2.0
270	9.9	6.4	3.5	2.0	2.0	2.0	2.0	2.0	2.0
280	11.8	8.1	4.9	2.1	2.0	2.0	2.0	2.0	2.0
290	13.9	9.9	6.5	3.5	2.0	2.0	2.0	2.0	2.0
300	16.0	11.7	8.1	4.9	2.1	2.0	2.0	2.0	2.0
310	18.3	13.7	9.8	6.4	3.5	2.0	2.0	2.0	2.0
320	20.7	15.8	11.7	8.1	4.9	2.1	2.0	2.0	2.0
330	23.2	18.0	13.6	9.8	6.4	3.5	2.0	2.0	2.0
340	25.9	20.4	15.7	11.6	8.1	4.9	2.1	2.0	2.0
350	28.7	22.9	17.9	13.6	9.8	6.5	3.6	2.0	2.0
360	31.7	25.5	20.2	15.7	11.7	8.2	5.0	2.2	2.0
370	34.7	28.3	22.7	17.9	13.6	9.9	6.6	3.7	2.0
380	38.0	31.1	25.3	20.2	15.7	11.8	8.3	5.2	2.4
390	41.3	34.1	27.9	22.6	17.9	13.8	10.1	6.8	3.8
400	44.8	37.2	30.7	25.0	20.1	15.8	11.9	8.4	5.3
410	48.2	40.3	33.5	27.7	22.6	18.1	14.0	10.4	7.2
420	51.5	43.4	36.4	30.4	25.2	20.6	16.4	12.7	9.4
430	54.8	46.5	39.4	33.3	27.9	23.2	19.0	15.2	11.8
440	58.4	49.9	42.6	36.4	30.9	26.0	21.7	17.8	14.4
450	62.1	53.4	46.0	39.6	33.9	29.0	24.6	20.6	17.1
460	65.9	57.0	49.5	42.9	37.1	32.1	27.6	23.5	19.9
470	69.8	60.7	53.0	46.3	40.4	35.2	30.6	26.5	22.8
480	73.7	64.4	56.5	49.7	43.7	38.4	33.7	29.5	25.7
490	77.5	68.1	60.0	53.0	46.9	41.5	36.7	32.4	28.5
500	81.2	71.6	63.4	56.2	50.0	44.5	39.6	35.2	31.2
510	84.9	75.1	66.7	59.4	53.0	47.4	42.4	37.9	33.9
520	88.4	78.4	69.9	62.4	55.9	50.2	45.1	40.5	36.4
530	91.8	81.6	72.9	65.3	58.7	52.9	47.7	43.0	38.8

L_t/D_s	12	13	14	15	16	17	18	19	20
540	95.2	84.8	75.9	68.1	61.4	55.5	50.2	45.4	41.2
550	98.4	87.8	78.8	70.9	64.0	58.0	52.6	47.8	43.4
560	101.6	90.8	81.6	73.6	66.6	60.5	55.0	50.1	45.6
570	104.8	93.8	84.4	76.3	69.2	62.9	57.3	52.3	47.8
580	107.9	96.8	87.2	78.9	71.7	65.3	59.6	54.5	49.9
590	111.0	99.7	90.0	81.5	74.2	67.7	61.9	56.7	52.0
600	114.0	102.5	92.6	84.0	76.5	69.9	64.0	58.8	54.0
610	117.0	105.3	95.2	86.5	78.9	72.1	66.2	60.8	56.0
620	120.0	108.0	97.8	88.9	81.2	74.4	68.3	62.8	58.0
630	122.9	110.7	100.4	91.3	83.5	76.6	70.4	64.8	59.9
640	125.7	113.4	102.9	93.7	85.8	78.7	72.4	66.8	61.7
650	128.6	116.1	105.4	96.1	88.0	80.8	74.4	68.7	63.6
660	131.4	118.7	107.8	98.3	90.1	82.8	76.3	70.6	65.3
670	134.2	121.2	110.2	100.6	92.2	84.8	78.3	72.4	67.1
680	136.9	123.8	112.6	102.9	94.3	86.8	80.2	74.2	68.9
690	139.6	126.3	115.0	105.1	96.4	88.8	82.1	76.0	70.6
700	142.3	128.8	117.3	107.3	98.5	90.8	83.9	77.8	72.3
710	144.9	131.3	119.6	109.4	100.5	92.7	85.7	79.5	73.9
720	147.5	133.7	121.8	111.5	102.5	94.6	87.5	81.2	75.5
730	150.1	136.1	124.0	113.6	104.5	96.5	89.3	82.9	77.1
740	152.7	138.5	126.2	115.7	106.5	98.3	91.1	84.5	78.7
750	155.3	140.8	128.5	117.8	108.4	100.1	92.8	86.1	80.3
760	157.8	143.1	130.6	119.7	110.3	101.9	94.4	87.8	81.7
770	160.2	145.4	132.7	121.7	112.1	103.6	96.0	89.3	83.2
780	162.6	147.6	134.8	123.7	113.9	105.3	97.6	90.8	84.7
790	165.1	149.9	136.9	125.6	115.7	107.0	99.2	92.3	87.0
800	167.5	152.1	138.9	127.4	117.4	108.6	100.8	93.8	1,486.0

(1) Consider a vessel in which:

$L_t = 450$ feet.
$D_s = 30$ feet.
$L_t/D_s = 450/30 = 15$.

In the table under the L_t/D_s column headed 15 and opposite the L_t of 450 read 39.6 inches which is the distance from the molded line of the second deck at the side to the place where the upper edge of the tonnage mark should be placed.

(2) Consider a vessel in which:

$L_t = 424.80$ feet.
$D_s = 28.00$ feet.
$L_t/D_s = 424.80/28.00 = 15.17$.

It will be necessary to interpolate to obtain the distance from the molded line of the second deck to the upper edge of the tonnage mark. Set down figures from the table and from the actual dimensions of the vessel as follows:

L_t	Tabular L_t/D_s 15	Actual L_t/D_s 15.17	Tabular L_t/D_s 16
From table 420	30.4	....	25.2
Actual 424.80	r	a	s
From table 430	33.3	....	27.9

$r = 30.4 + 0.48(33.3 - 30.4) = 31.79$.
$s = 25.2 + 0.48(27.9 - 25.2) = 26.50$.
$a = r - 0.17(r - s)$.
$a = 31.79 - 0.17(31.79 - 26.50) = 30.89$ inches.

§ 69.15–33 Line of the second deck

No line of the second deck shall be marked on the side of the vessel.

§ 69.15–35 Line of the uppermost complete deck.

(a) For a vessel having no statutory loadline, the line of the uppermost complete deck shall be marked similarly to the deck line provided by the Load Line Convention.

(b) The deck line shall be a horizontal line 12 inches long and 1 inch wide. It shall be marked abaft amidships above the place on each side of the vessel prescribed in § 69.15–21 for the tonnage mark. Its upper edge shall pass through the point where the continuation outward of the upper surface of the freeboard deck intersects the outer surface of the shell. (See Figure 58 (§ 69.15–39(a)).) Where the deck is partly sheathed amidships, the upper edge of the deck line shall pass through the point where the continuation outward of the upper surface of the actual sheathing at amidships intersects the outer surface of the shell.

§ 69.15–37 Placing the tonnage mark in relation to the deck line.

(a) As a practical matter, since the molded line of the second deck is not to be marked on the side of the vessel, the position of the tonnage mark shall be determined by reference to the deck line for freeboard or, in the absence of such a line, with reference to the deck line provided by § 69.15-35.

(b) The upper edge of the tonnage mark shall be below the upper edge of the deck line, a distance equivalent to the sum of the vertical distance (determined by reference to the tonnage mark table) from the molded line of the second deck or equivalent to the upper edge of the tonnage mark plus the vertical distance from the molded line of the second deck or equivalent to the upper edge of the deck line. (See in Figures 55 and 56 (§ 69.15-23(b)), a+t=m.)

(c) In the case of a vessel for which it is desired to have only one set of tonnages, the tonnage mark shall be placed at the level of the uppermost part of the load line grid as provided by § 69.15-23(b). (See Figure 56.)

§ 69.15-39 Application for measurement according to the optional dual tonnage method.

(a) Application of the owner or his agent for measurement of a vessel under the provisions of the optional dual tonnage method shall be submitted in duplicate together with supporting plans or sketches to the Officer in Charge of the marine inspection zone in which the vessel is or will be located.

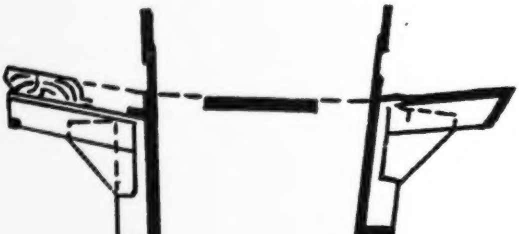


FIGURE 58.—Deck line—12 inches×1 inch

(b) The application shall include the following information: (See Figures 55, 56, and 57 (§§ 69.15-23(b) and 69.15-29(c)).)

(1) Molded depth at midship section from second deck at side.

(2) Depth used with tonnage mark table.

(3) Length of shorter portion of stepped second deck, if any.

(4) Total length of longer and shorter portions of stepped second deck.

(5) Length used with tonnage mark table.

(6) Height of step (break) in the second deck, if any.

(7) Distance from the molded line of the second deck or equivalent to the upper edge of the tonnage mark.

(8) Molded draft to the upper edge of the tonnage mark.

(9) Freeboard from the loadline certificate.

(10) Molded draft to the loadline.

(11) Horizontal distance from the centerline of the loadline disk to the apex of the triangle on the tonnage mark.

(12) Vertical distance from the deck line to the tonnage mark.

(13) Vertical distance from the molded line of the second deck or equivalent to the deck line for freeboard.

(14) Allowance for fresh water and tropical waters (one forty-eighth of the molded draft to the upper edge of the tonnage mark).

(15) The name and official number of the vessel, if assigned.

(16) Builder's name and hull number if official number has not been assigned.

(17) Time and place vessel will be available for measurement.

(18) Whether two sets of tonnages are desired.

(c) The owner may request confirmation of the proposed location of the tonnage mark based on the information contained in the application.

(d) On a copy of the application or on an attachment thereto, the owner shall be advised:

(1) That the vessel will be measured under the provisions of the optional dual tonnage method; and

(2) Whether the proposed location of the tonnage mark determined according to the information furnished on the application is correct under the

provisions of the regulations in this subpart.

§ 69.15-41 Certification as to location of the tonnage mark.

(a) Before a certificate of admeasurement shall be issued for a vessel requiring a tonnage mark, the owner or his agent shall certify that a tonnage mark has been placed on each side of the vessel in accordance with the pertinent provisions of the regulations in this subpart.

(b) A certification by the American Bureau of Shipping or other recognized classification society that the tonnage marks have been placed on the vessel in accordance with the provisions of the regulations in this subpart shall be accepted as evidence of proper marking.

(c) In the absence of a certification by the American Bureau of Shipping or other recognized classification society, the Officer in Charge may at any time cause a tonnage mark to be verified on a vessel in his marine inspection zone.

Subpart 69.17—Optional Simplified Admeasurement Method for Pleasure Vessels

§ 69.17-1 Definition of terms used in this subpart.

(a) *Overall length.* The term "overall length" means the horizontal distance between the foremost part of the stem and the aftermost part of the stern, excluding bowsprits, bumpkins, rudders, outboard motor brackets, and similar fittings or attachments.

(b) *Overall breadth.* The "overall breadth" is the horizontal distance, excluding rub rails, from the outside of the skin (outside planking or plating) on one side to the outside of the skin on the other, taken at the widest part of the hull.

(c) *Overall depth.* The "overall depth" is the vertical distance taken at or near midships from a line drawn horizontally through the uppermost edges of the skin at the sides of the hull (excluding the cap rail and trunks, cabins, or deckhouses) to the outboard face of the bottom skin of the hull. This excludes the keel unless the keel is covered by the skin.

(d) *Measurement of overall length, depth, and breadth.* Overall length and depth are measured in the vertical plane of the centerline; overall breadth, in a line at right angles to the vertical plane of the centerline.

(e) *Register length, breadth, and depth.* The overall length, breadth, and depth, as defined in this section, of a vessel measured under the provisions of this subpart shall be deemed to be the vessel's register length, breadth, and depth.

(f) *Vessel designed for sailing.* The term "vessel designed for sailing" means a vessel, whether or not equipped with an auxiliary motor, which has the fine lines of a sailing craft and is in fact propelled by sail or capable of being propelled by sail, other than a mere steadying sail.

§ 69.17-3 Application for simplified admeasurement.

(a) Upon application by the owner for simplified admeasurement, filed with and approved by the Officer in Charge for the marine inspection zone where the vessel is located, a vessel which is intended to be used exclusively for pleasure shall, whether or not it has been previously admeasured, be admeasured in accordance with the provisions of this subpart. The application shall state the owner's name and address, the vessel's name and rig, her overall length, breadth, and depth, as defined in § 69.17-1, the name of the builder, and the vessel's model, serial, and official number, if any. Where the vessel appears to be subject to admeasurement under the provisions of § 69.17-5(b) or (d), or both, the application shall be accompanied by dimensioned sketches, not necessarily to scale of the arrangement, profile, and cross section of the vessel, indicating thereon the points to which the dimensions were taken.

(b) Dimensions shall be stated on the application in feet and inches or in feet and decimal fractions of feet. The register length (L), breadth (B), and depth (D) used in calculating the vessel's tonnages and shown on the vessel's document shall be in feet and decimal fractions of feet.

§ 69.17-5 Calculation of gross tonnage.

(a) Except as provided in paragraphs (b) and (d) of this section, the gross tonnage of a vessel designed for sailing shall be one-half (LBD/100), and the gross tonnage of a vessel not designed for sailing shall be two-thirds (LBD/100), LBD being the product of overall length, breadth, and depth.

(b) Where a vessel's hull approximates in shape a regular geometric solid, the gross tonnage of the hull shall be her volume as calculated by the use of appropriate geometric formulae, expressed in tons of 100 cubic feet.

(c) The gross tonnage of a catamaran or trimaran shall be arrived at by adding the gross tonnages of her hulls as calculated under this section.

(d) Where the volume of the deckhouse is disproportionate to the volume of the hull, as in the case of certain houseboats, the volume of the deckhouse, calculated by the use of appropriate geometric formulae, expressed in tons of 100 cubic feet, shall be added to the gross tonnage of the hull as previously calculated.

§ 69.17-7 Calculation of net tonnage.

(a) Except as provided in paragraph (b) of this section, the net tonnage of a vessel designed for sailing shall be nine-tenths of her gross tonnage, and the net tonnage of a vessel not designed for sailing shall be eight-tenths of her gross tonnage.

(b) The net tonnage of a vessel which has no propelling machinery in the hull shall be the same as her gross tonnage.

§ 69.17-9 Readmeasurement of vessels admeasured under this subpart.

(a) A vessel admeasured under the provisions of this subpart may, upon application by the owner, be readmeasured under the appropriate provisions of §§ 69.03-1 through 69.15-41.

(b) A vessel admeasured under the provisions of this subpart which is thereafter to be documented for use other than exclusively as a pleasure vessel shall be readmeasured under the appropriate provisions of §§ 69.03-1 through 69.15-41.

FINDING AIDS

A list of CFR titles, subtitles, chapters, subchapters and parts, and an alphabetical listing of agencies publishing in the CFR are included in the subject index volume to the Code of Federal Regulations which is published separately and revised semiannually (January 1 and July 1).

Material Approved for Incorporation by Reference
Table of CFR Titles and Chapters
Alphabetical List of Agencies Appearing in the CFR
Redesignation Table
List of CFR Sections Affected

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Material Approved for Incorporation by Reference

The Director of the Federal Register approves the following incorporations by reference for one year effective October 1, 1981, unless otherwise noted (5 U.S.C. 552(a) and 1 CFR Part 51). For more information on incorporation by reference, see the preliminary pages of this volume.

46 CFR SUBCHAPTER F

COAST GUARD, DEPARTMENT OF TRANSPORTATION

American Boat and Yacht Council

P.O. Box 806–190 Ketchum Ave., Amityville, NY 11701

P–1 Safe Installation of Exhaust Systems for Propulsion and Auxiliary Machinery, 1973.	58.10–5

American Bureau of Shipping

65 Broadway, New York, NY 10006

Rules for Building and Classing Steel Vessels, 1981	58.01–5; 58.01–5; 58.20–5

American National Standards Institute

1430 Broadway, New York, NY 10018

ANSI B1.1–1974—Unified Inch Screw Threads	56.60–1
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Redesignation Table

Note: The following Table shows the relationship between the rules, regulations, and instructions formerly codified in Title 19, Parts 1, 2, 3, and 4 with the new sections as transferred to Title 46, Part 66, 67, and 69 (34 FR 20102, Dec. 23, 1969).

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66.01-1	None.
66.01-3	None.
66.03-1	None.
66.03-3	None.
66.03-5	3.1(a).
66.03-7	3.1(b).
66.03-9	3.1(c).
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66.03-13	3.1(e).
66.03-15	3.1(f).
66.03-17	3.1(h).
66.03-19	3.1(i).
66.05-1	1.2(c) (Ports of Documentation).
67.01-1(a)	3.2(a).
67.01-1(b)	3.2(b).
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67.01-7(b)	3.2(e).
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67.03-5(b)	3.19(b).
67.03-5(c)	3.19(c).
67.03-7(a)	3.19(a)(4).
67.03-7(b)	3.19(e).
67.03-9	3.20(a).
67.03-11	3.20(b); footnotes 12, 13.
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67.09-3	3.12(b).
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67.11-1(b)	3.13(b).
67.11-1(c)	3.13(c).
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67.11-3(b)	3.13(e).
67.11-5	3.13(f).
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67.13-3	3.16(b).
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67.13-9	3.16(e).
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67.15-3	3.14(b).
67.17-1	3.15(a).
67.17-3	3.15(b).
67.19-1	3.17(a).
67.19-3(a)	3.17(b).
67.19-3(b)	3.17(c).
67.19-5	3.17(d).
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67.21-3	3.18(b).
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67.23-7(a)	3.21(f).
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67.23-7(c)	3.21(h).
67.23-7(d)	3.21(i).
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67.23-13	3.21(e).
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67.27-3	3.23(b).
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67.29-3(b)	3.24(b).
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